INDIA RUBBER WORLD
FOUNDED 1889
Reg. United States Pat. Off. Reg. United Kingdom.

Published on the 1st of each month by

THE INDIA RUBBER PUBLISHING CO.
No. 25 West 45th Street, New York.
Telephone—Bryant 2576.
CABLE ADDRESS: IRWORLD, NEW YORK

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Vol. 65 NOVEMBER 1, 1921 No. 2

SUBSCRIPTION: $3.00 per year, $1.75 for six months, postpaid, for the United States and dependencies and Mexico. To the Dominion of Canada and all other countries, $3.50 (or equivalent funds) per year, postpaid.

ADVERTISING: Rates will be made known on application.

REMITTANCES: Should always be made by bank draft, Post Office or Express Money Order on New York, payable to THE INDIA RUBBER PUBLISHING COMPANY. Remittances for foreign subscriptions should be sent by International Postal Order, payable as above.

A GREAT LEADER'S SUCCESSOR

WALL STREET was inclined to see in the demise of Colonel Colt a death blow to the great organization that he had created in rubber. That its fears were unfounded is proved by the election of Charles B. Seger as chairman of the board of directors, and Lester Leland as assistant chairman. The latter possesses not only an intimate knowledge of the many companies that comprise the United States Rubber Company but has in an unusual degree the faculty of harmonizing differences in policy and in individuals and in inspiring unquestioned loyalty. The former's executive ability is well known. The two men embody all of the administrative qualities that Colonel Colt possessed with the priceless possessiveness of comparative youth and abounding health.

THE L. C. OF R.

MANY, who a few short months ago were suffering from and bewailing the H. C. of L., have forgotten it in the presence of another trouble—the Low Cost of Rubber. The fact that crude rubber will not, cannot remain at its present low price is generally admitted. To a degree it is a handicap not only to planters, importers and reclaimers but to manufacturers of rubber goods as well. With a shortage predicted in cotton and resultant high prices, contracts based upon present raw material prices are hazardous. Something, anything, to stabilize is vital to progress.

CEYLON RUBBER PRICES

CEYLON is selling plantation rubber at 6½ pence, say 13 cents, a pound, and it is claimed at a profit. The planters there see no reason why they should restrict their output even if Malaya cannot meet their low prices. Of course, planters in Ceylon have other products as tea, which possibly helps in low cost production of rubber. That they have any other advantage over Malaya does not appear, certainly soil and climate are hardly as favorable. Is it possible that the Hevea plantation of the future is to be a composite affair, as cane, coffee, cacao, tea and rubber?

VALUATION AND UNDERVALUATION

FOR years American manufacturers have felt that unfair methods entered into the importing of rubber goods into the United States. The protective tariff did not protect. Thirty and more years ago a prominent maker of mackintoshes thus expressed himself in these pages:

"Why is it that foreign manufacturers are in a position to send thousands of single and double texture, so-called mackintosh garments into this country, the purchaser paying a heavy duty on them, when precisely this class of goods is manufactured here of fully as attractive materials, made up in much better styles, and vastly superior in quality to the foreign goods? Is it because the foreign manufacturer pays less for his crude materials? Is it because he pays less for his labor? Or is it because the purchasing community must have foreign goods? These are reasons which have suggested themselves to us, and after careful investigation we find that none of them explain the facts. We have it on good authority that nine-tenths of this class of goods find their way into this country dishonestly.

"This is a sweeping charge and a serious one, but we have every reason to believe that it is a fact, nevertheless, and the question as to how goods can be imported dishonestly into this country, is answered by the word, 'undervaluation.' Were the foreign manufacturer compelled to invoice the goods he ships at their honest value, our home manufacturers would get nearly the full benefit of the existing tariff; and since the demand for mackintoshes is growing constantly in this country, and it is only a question of very little time when they will form a vast industry, it is well worth taking the necessary steps to stop this manifest evil while the business is in its infancy."

Other lines of rubber manufacture have suffered just as severely. That is why the valuation project in the Fordney Tariff Bill is thought well of.

Particularly is this true when German rubber goods, valued on the basis of the depreciated German mark, are today flooding the country.

A TIRE ADJUSTERS' ASSOCIATION

WORD comes that one of the well-known tire adjusters has set on foot a movement for the formation of an association of adjusters local to New York at first but later to embrace the whole field. The plan is interesting and should be productive of good.

Tire adjustment requires a broad knowledge of tires and of men, judicial fairness, good nature, and a tolerant and forgiving appreciation of the covetous and unreliable side of human nature. As all are not equally endowed with these qualities the getting together and the exchange of experiences should be helpful to many. Moreover, such heart-to-heart talks will never be dull but will be replete with anecdote and humor. As the meetings are to be secret, however, the discussions will not afford the news gatherers the matter that otherwise would prove good reading. When the Association gets its stride, papers from prominent adjusters will doubtless read thus:

Mental Mileage vs. Actual Mileage.

Prevarication and Punctures, How to Avoid.

Guarantees on the Part of Tire Users.

Psychology as an Aid in Settling Claims Made by Women.

Basic Differences Between Truth and Falsehood as Applied to Worn Treads.

Perverted Views Synchronized with Cold Fact by the Application of the Mendelian Theory.

What David Said in His Haste.

CHICLE CHEWING THREATENED

IN its beginnings chewing gum of chicle was a comestible pleasant to chew and easy to dispose of after use. Plastic, but not sticky, it could easily be parked on piano ledge, window sill, or under a chair seat where it hardened and clung, and when retrieved for further use was easily handled and became again plastic only through the moist warmth of the user's mouth. Furthermore, one could form huge bubbles of it, or could pull long filaments from the teeth to extended right arm, and return them to the mouth with no particle clinging to the fingers. Rolled into a ball and cast aside it hardened and became as harmless as a pebble.

Today it is all that could be desired in wrapping, flavor or digestive medicament. But there its virtues end. Often it sticks to the teeth and always it adheres to the fingers. To put it aside in the time honored places is to invite adhesive trouble in infinite variety. To void it into the pathway brings curses from pedestrians, who track gobs of semi-glue wherever they go. It ruins carpets, upholstery, dresses and tempers. The chewing gum barons are riding for a fall. Soon, alas, too soon! the American housewife will arise in her wrath and gum will be taboo. A Volstead in chicle is due.

PRELIMINARIES TO STANDARDIZATION

IT is no longer necessary to remind rubber manufacturers of the important bearing standardization has upon success. Lost motion means lost profits, rule-of-thumb methods are too inexact for modern factory practice, the making of needless varieties leads to waste; and that simplified processes enable all to better meet competition. The first step toward standardization is taking account of stock; and that is difficult through lack of exact terminology. Certain it is that the shop inventory would be much simplified if the materials employed be accurately defined and their uses, sizes, and qualities precisely stated. It is as an aid for such classification that the glossary of terms now running in these pages is designed. With ample, detailed listing the task of systematizing and standardizing is brought one step nearer.

THE ALERTNESS OF RUBBER MANUFACTURERS IN MEETing objection to real and fancied shortcomings in their wares, as in the case of rubber toy balloons, to which some health boards recently took exception, claiming that a few children showed slight toxic symptoms from contact with colored rubber and mouth-pieces, is well shown by the fact that dipped goods makers are now putting out such toys in sealed packages accompanied with a sanitary guarantee that should satisfy the most finical conservators of the public health. As a matter of fact, no real case was made against toy balloons, *per se;* and it has been well shown that the fire hazard of such toys inflated with illuminating gas was trifling. Even the remote risk of hydrogen may soon be removed, and before long the little elastic spheres may be blown up with non-combustible helium gas such as the Government is using experimentally in war balloons.

AT AN OLD-FASHIONED SPELLING BEE THE WORD VALEtudinarianism usually broke up the party. Fancy what would have happened if someone had sprung such a term as paranitrosodimethylaniline! This name, which our esteemed and ingenious friends, the rubber chemists, have wished on one of the newer accelerators has one rival—the English alphabet of 26 letters. It is true that many of the new terms are as expressive as the laboratory compounds are invaluable, but some of the recent sesquipedalian additions to rubber nomenclature are, to use the vernacular, "the limit" for the tyro in the trade, who cannot but wonder why it is that the shorter the chemists make the time of curing the longer they make the title of the agent used. Some day in self-defense the industry may be forced to substitute code numbers or even hieroglyphics for such multisyllabic orthographical exuberance.

Rubber Manufactures and the Tariff

By Richard Hoadley Tingley

THE administration tariff bill (H. R. 7456), known as the Fordney Bill, which passed the House of Representatives last summer, is in the hands of the Senate Committee where more or less drastic alterations will undoubtedly be made and it is expected that two or three months are likely to elapse before any final tariff legislation is written into the record.

THE INDIA RUBBER WORLD has received so many inquiries from rubber manufacturers asking to be informed on what the rubber trade is doing to protect its interests at Washington, and to be advised on what action, mass or individual, is being taken or ought to be taken to protect its interests, and upon the provisions of the Fordney tariff generally, that the following article has been prepared with a view to making a general reply to these inquiries.

In what follows it has been the endeavor to reflect the mass opinion of a large number of manufacturers of rubber goods of various kinds who have been seen in the matter, and to put forward the leading features of the Fordney Bill showing where and how it compares with the existing tariff—Underwood tariff of 1913—and with the tariff of 1909 in force prior to that time.

In investigating the subject several points stand out clearly. First, there is by no means a unanimity of opinion among the manufacturers on the tariff question and manufacturers of certain goods fear no foreign competition and therefore are apathetic. Others, however, feel that the menace of this competition is a serious one in their particular lines and are strong for the highest kind of protection obtainable. It is evident, also, that the rubber trade, even the branches which desire additional tariff legislation more favorable to them, have not yet gotten together for a mass presentation of their wants at Washington, and that the little work already done before the congressional committees has been by individual companies.

It is seen that any presentation of tariff matters with respect to rubber manufactures is going to be somewhat handicapped because of lack of knowledge of the volume and value of production and of imports of particular goods. In this matter rubber manufacturers will find their case a difficult one to argue because the manufacturers and producers of almost every other class of commodities send their representatives to Washington fully posted on all such details. The difficulty lies in a lack of cooperative organization, of a "get together," which has long been in evidence in the trade, and a desire to withhold detailed figures for their personal use only. In a general way, production figures are now public property, but they are mass, rather than detailed figures. Imports of rubber manufactures, also, are by no means satisfying where accurate information, such as congressional committees require, is needed. Under the tariff, rubber imports are classified in but a few general heads which render total volume and value easily obtainable. Import information as to the value of the innumerable specific goods coming under the general tariff classifications is lacking.

For the purpose of illustrating this and other points Table 1 is presented.

The apparent slight discrepancy between this and other tables herewith is in the fact that certain items of substitutes have been here omitted; also, certain items covering reciprocal relations with Cuba.

In this table it will be seen that druggists' sundries, vulcanized hard rubber goods, sponges, and tires are the only manufactures of rubber that find a specific place in tariff schedules, all other rubber goods coming under the general headings of gutta percha and india rubber. It will readily be seen, therefore, that there are a large number of manufactures into which these heads must be subdivided and of which the tariff takes no account as to their specific value, although all are accounted for under one classification or another as above. It must be also noted that tariff provisions call for the classification of merchandise composed of two or more component materials, under the heading of the material of the greatest value. This provision eliminates from the import list practically all rubberized fabrics, and the totals of value, so far as rubber imports are concerned, are therefore misleading for the value of rubber in such goods, although not the chief article of value in them, is large.

In order to complete the statistical information regarding the imports of manufactures of rubber goods, Table 2 is introduced in which no attempt has been made to classify the manufactures, merely giving the total import value of all rubber goods, for the years 1914 and 1917-1920 inclusive, and for the first six months of 1921. In the values here noted it must also be remembered that they include no rubber goods of which rubber is not the chief component value, and that the value of the many imported rubberized fabrics is not found in the totals.

TABLE 1

UNITED STATES IMPORTS OF MANUFACTURES OF INDIA RUBBER AND GUTTA PERCHA ENTERED FOR CONSUMPTION—1914, 1919 AND 1920

Tabulated from Reports of the Department of Commerce, Bureau of Foreign and Domestic Commerce.

	1914[3]		1919[4]		1920[4]	
	Duty, Per Cent	Value	Duty, Per Cent	Value	Duty, Per Cent	Value
Gutta percha	35[1]	$3,157				
	10[2]	28,674	10	$143,438	10	$199,265
India rubber	35[1]	101,878				
	10[2]	755,525	10	368,169	10	674,277
Druggists' sundries	15	125,390	15	64,579	15	217,027
Vulcanized hard rubber	35[1]	64,277				
	25[2]	312,630	25	4,624	25	88,058
Sponges	40[1]	817				
	15[2]	2,242	15	5	15	397
Tires, etc.	..	.....	10	368,146	10	194,445
Totals	..	1,484,590	..	948,961	..	1,373,469

Notes:
[1]Indicates tariff of 1909 (July 1 to October 3, 1913).
[2]Indicates tariff of 1913 (October 4, 1913, to June 30, 1914).
[3]Indicates fiscal year.
[4]Indicates calendar year.

TABLE 2

SUMMARY OF UNITED STATES IMPORTS OF DUTIABLE MANUFACTURES OF INDIA RUBBER AND GUTTA PERCHA FOR THE FISCAL YEAR 1914 AND THE CALENDAR YEARS 1917, 1918, 1919 AND 1920

Compiled from Reports of the United States Department of Commerce, Bureau of Foreign and Domestic Commerce

	Imports	
	India Rubber	Substitutes
1914	$1,559,812	87,642
1917	765,975	44,084
1918	445,332	383,497
1919	956,085	47,966
1920	1,433,957	13,946
1921		
January	44,918	...
February	65,009	250
March	76,612	...
April	95,913	...
May	77,853	30
June	81,608	...
Total, 6 months, 1921	441,913	280

The consensus of opinion among tire manufacturers is that their industry needs no protection. It is their opinion that the United States can easily compete with the world in the making of these goods and, further, that their distribution system which has been so effectively worked out will, of itself, shut the door to foreign competition. Fear of reprisals, also, on the part of foreign countries, particularly England, is partly responsible for their attitude. Exports of tires and tubes are an important part of their business and England has already considered placing an import duty on American tires. As a matter of policy, therefore,

tire men are silent on the tariff and are content to let the modest duty of 10 per cent ad valorem stand.

Some of the manufacturers of vulcanized hard rubber have already presented their case at Washington, asking for a higher rate of protection than that accorded by the Fordney Bill. Some of them think a 60 per cent duty none too high, while others will be content with 50 per cent. The Fordney Bill calls for a 30 per cent duty on these goods.

COMPARISON OF TARIFF ON VULCANIZED HARD RUBBER GOODS

ACT OF 1909	ACT OF 1913	FORDNEY BILL
Manufactures of . . . and vulcanized india rubber, known as hard rubber, of which . . . rubber is the chief component value, not specially provided for in this section, 35 per cent ad valorem.	Same definition, 25 per cent ad valorem.	Same definition, 30 per cent ad valorem.

COMPARISON OF TARIFF ON RUBBER TOYS

TARIFF OF 1909	TARIFF OF 1913	FORDNEY BILL
60 per cent ad valorem	40 per cent ad valorem	40 per cent ad valorem

The toy manufacturers of the United States have petitioned the Ways and Means Committee of the House of Representatives to raise the import duty on all toys, which includes rubber toys and rubber balloons, from 40 per cent as contained in the Fordney Bill, to 60 per cent. In this action they have the support of practically all the rubber toy manufacturers of the country.

These two interests, hard rubber and toys, are the only ones which have, so far as is known, presented their cases at Washington. They both fear German and Japanese competition. One manufacturer of hard rubber goods claims that the duty of 30 per cent as provided in the Fordney Bill is inadequate and favors an increase to 50 per cent ad valorem for the following reasons—reasons which may be said to apply with more or less force to the manufacturers of toys and many other articles. He says, in part, in his memorial to the Ways and Means Committee of the House:

"The cost of labor in our factories in 1920 was 65 per cent of the total cost, showing labor to material and overhead as the most important element. According to 'Wages,' a pamphlet prepared for the Ways and Means Committee, page 89:

Wages	1914	1920
United States	$2.05	$4.78
Germany	1.23	.80 to $1.20
Japan	.48	1.44

"In all export trade our costs on finished articles, which require the most skilled labor, are too high and we can only sell rough or heavy goods of greater material value and lesser labor value."

Comparison is also here made of the tariff of 1909, 1913 and the Fordney Bill with respect to druggists' sundries, cotton fabrics impregnated with rubber, and fountain pens as follows: In the case of druggists' sundries, additional protection above that accorded by the Fordney bill is desired. Clothing manufacturers, also, want additional protection, and nearly all manufacturers of rubberized cotton goods feel that they are entitled to a higher duty on their goods; notably, makers of printers' blankets where the duty is now but 10 per cent, while the tariff of 1909 accorded them a protection of 40 per cent. They want the old 40 per cent back again.

COMPARISON OF TARIFFS ON DRUGGISTS' SUNDRIES AND MISCELLANEOUS GOODS

ACT OF 1909	ACT OF 1913	FORDNEY BILL
Manufactures of which . . . or india rubber or gutta percha are the chief component material, not specially provided for in this section, 35 per cent ad valorem	Manufactures of which . . . india rubber or gutta percha are the chief component parts, not otherwise provided for in this section, as follows: druggists' supplies, 15 per cent. All other articles not specially provided for, 10 per cent ad valorem.	Manufactures of which . . . india rubber or gutta percha are the chief component parts not specially provided for, 20 per cent. Insulators and insulating material partly or wholly manufactured, composed wholly or chiefly of india rubber or gutta percha, 30 per cent.

COMPARISON OF TARIFFS ON COTTON FABRICS IMPREGNATED WITH INDIA RUBBER

ACT OF 1909	ACT OF 1913	FORDNEY BILL
Garters, tire fabric, suspenders, tubing made of cotton or other vegetable fibre and india rubber, of which cotton or the other material is the chief component value, 45 per cent ad valorem.	Bandings, belts, beltings, garters, tire fabrics, suspenders, as before, and india rubber, the fabric being self-edged and less than 12 inches wide, 25 per cent ad valorem.	Tubings, garters, suspenders, of cotton and india rubber, fast edges, less than 12 inches wide, 25 per cent ad valorem. This includes tire fabrics.
Belting for machinery, made of cotton and india rubber, 30 per cent ad valorem.	Belting for machinery as before, 15 per cent ad valorem.	Belting for machinery as before, 20 per cent ad valorem.
Bandings, belts, beltings, tapes, webs of cotton and india rubber, 60 per cent ad valorem.		
Garments of cotton waterproofed with india rubber, 50 per cent ad valorem.	Same, 30 per cent ad valorem.	Garments and clothing wholly or partly of cotton, manufactured, waterproofed with india rubber, 33 per cent ad valorem.
Hose made of cotton fabric and india rubber, 15 cents per pound.	Same, 7 cents per pound.	Same, 26 per cent ad valorem.

COMPARISON OF TARIFFS ON FOUNTAIN PENS

This item includes penholder tips, penholders and parts thereof, fountain pens and stylographic pens, combination penholders comprising penholder, pencil, rubber eraser, automatic stamp or other attachment.

ACT OF 1909	ACT OF 1913	FORDNEY BILL
Penholder tips and parts thereof, 5 cents per gross and 25 per cent ad valorem.	Provides that all penholders, etc., above described, shall pay a 25 per cent ad valorem duty.	Fountain pens as above described, valued at not more than $2 per dozen, 72 cents per dozen.
Fountain and stylographic pens, 30 per cent ad valorem.		Valued at more than $2 and less than $6 per dozen, $1.50 ad valorem duty per dozen.
Combination pen and penholder as above, 40 per cent ad valorem.		

In order to show the relative value, so far as possible, of the production, exports and imports of rubber manufactures, Table 3 is presented.

TABLE 3

COMPARATIVE VALUE OF UNITED STATES PRODUCTION, EXPORTS AND IMPORTS OF MANUFACTURES OF INDIA RUBBER GOODS—CALENDAR YEAR, 1919

	Production[1]	Exports[2]	Imports[2]
Rubber hose, belting and steam packing	$56,751,000	$6,100,460	Otherwise noted
Boots and shoes	134,516,000	5,266,699	Otherwise noted
Druggists' sundries	13,834,000	1,270,506	$64,579
Tires and tubes, all kinds	752,927,000	30,481,886	368,146
All other manufactures	180,188,000	9,097,773	516,236
Totals	$1,138,216,000	$52,216,724	$948,961

[1] From report of United States Department of Commerce, Bureau of the Census.
[2] From same department, Bureau of Foreign and Domestic Commerce.
Note—Exports equal 4.6 per cent of production. Imports equal 8/100 of one per cent of production.

The Fordney Bill as it now stands is in many respects a compromise between the Act of 1909 and that of 1913. There is no mistaking the fact, however, that it will be radically changed before it becomes a law.

In view of the importance attached to having an equitable adjustment made in tariffs to apply for the next few years it would seem advisable that rubber manufacturing interests pool their issues as the manufacturers of other commodities have done, and present their mass arguments to congressional committees backed by the best statistical information obtainable. Such information, however, should include a better knowledge than at present exists of the volume and value of the many separate items of rubber manufactures, both as to production and import.

Possibilities and Problems in the Manufacture of Rubber Heels

By Chester C. Burnham

THE rubber heel industry has grown to considerable proportions within the last five years and is now an important branch of the rubber manufacturing industry. The supply of rubber heels is not nearly equal to the demand and rubber manufacturers so minded may convert departments that have irregular production and questionable profits into steady producers and at a very satisfactory profit.

Slowly but surely, the rubber heel has come into its own, and where formerly only a very few kinds of shoes with rubber heels could be found it is now equally rare to find shoes with all leather heels. This great growth has not been sudden, but it may have *seemed* sudden because of recently published statistics regarding the quantity of rubber heels that have been manufactured. These figures were so large as to compel attention and to suggest the inquiry whether the trade has not reached the saturation point. The answer is that there is even now a scarcity of rubber heels and any rubber manufacturer so minded may find a ready market for his goods provided they conform to the necessary standards.

A—DRIVING PLATE EASILY SLIDES INTO PLACE. B—SWINGING LOADER ARM HOLDS NAILS UNTIL DROPPED IN BED. C—BED, DRILLED IN SAME MANNER AS STANDARD TEMPLATE. D—THE HEEL BASE IS NAILED ON WITH ONE OPERATION AND THE RUBBER HEEL AT ANOTHER. BOTH NAILED ON THE SAME MACHINE, BUT AT DIFFERENT TIMES. E—ADJUSTABLE JACK OR REST FOR SHOE.

THE GREAT DEMAND

The INDIA RUBBER WORLD for August, 1921, reported that Akron factories produced more than 100,000,000 pairs of heels last year. One of the largest producers of rubber heels recently announced that the production for that day was 203,138 pairs of heels, and furthermore stated that the average daily production was 190,000 pairs. The layman can hardly understand these figures of rubber heel output but this seemingly large production is but a drop in the bucket as compared with the present day demand. The present popularity of rubber heels is not a whim or fad, nor is it the result of any overwhelming sales effort on the part of the rubber heel manufacturers. Rubber heels have come into general demand because people have discovered that they like them.

There are something like 200 different brands of heels now on the market. Four manufacturers are producing 150,000 pairs a day, several more are producing 50,000 pairs a day, and still others producing below that figure, and every plant running at full capacity whatever that may be. Several factories are running mostly on contract terms that assure them maximum production for weeks to come and at a time when nearly all industries are slack and at a time, too, when the rubber factories are somewhat slack, this point should have great significance.

PRINCIPAL OUTLETS

In order to understand this large demand for rubber heels one must know something about the shoe production of this country and also about the various markets for rubber heels. The outlet is by way of three distinct and non-conflicting channels: (1) To the shoe manufacturer; (2) To the shoe findings jobber; (3) To the 5 and 10-cent chain stores.

The shoe manufacturer buys his heels in bulk and on a given quality of heel properly enjoys all the benefits to which simplified shipping methods and large orders entitle him in the matter of price. In direct contrast to this outlet is that of the shoe findings jobber who must have his heels put up in a different manner and therefore pays a slightly higher rate for the same goods. For his trade, heels are usually packed one pair in a box with an envelope of nails for attaching. Twelve single-pair packages are packed in a carton and finally, twelve cartons are packed in a case with considerable advertising matter. Competition is getting so keen nowadays that considerable money is spent in getting up attractive packages and advertising matter to further the sales of finder's heels. The peculiar needs of the 5 and 10-cent store trade, demand that the heels be stapled together with wire and packed in plain boxes for convenience in stock taking, usually three dozen or a gross pair in a box. No display packages or advertising matter is required and of course the quality of this heel is limited somewhat by the price at which it must sell. Few of the chain stores sell heels for 25 cents.

The shoe manufacturer buys heels by the hundred or thousand pairs while the other classes order them in dozens or by the gross. Heels sold to the findings trade are often ½-inch or even 9/16-inch thick while the same heel will satisfy the shoe manufacturer many times if it is only ⅜-inch thick. Different center plates are used where the equipment is limited but the same face and back plates are often used for all thicknesses.

LEATHER SHOE PRODUCTION

To obtain the proper perspective on shoe production figures one must gear up his ideas of big production to high speed and be prepared for some amazing revelations. A summary of the figures found in the 1921 edition of the Directory of Shoe Manufacturers of the United States, reveals the fact that the capacity—probably the maximum capacity—of the combined shoe factories of the United States, including all kinds of footwear, except rubber footwear, is 2,130,000 pairs a day. These figures must be taken with a grain of salt, however, for it is a known fact that very few of these factories produce up to their full capacity for any considerable portion of the year, and when holidays and shut-

downs are considered and proper deductions made, the result is a net productiveness from a 250 day year of not more than 60 per cent of the above capacity. On this reduced basis, however, the daily production of shoes will be around 1,278,000 pairs.

To avoid error in making these deductions and for fear these shoe production figures may be thought unduly optimistic, consider the figures compiled by a prominent leather merchant, James M. Montgomery, of the Richard Young Co. of New York. These figures were compiled in May, 1919, and show the production by states. In the course of his report, Mr. Montgomery concludes that if all these factories produce on a 75 per cent basis the United States would be adequately supplied with shoes, and further, he asserts that if they should produce at 66-2/3 per cent of capacity the shoe industry would be in a healthy condition and relieved from the burden of overproduction. Shoe production should increase proportionately with the increase in population. The variance between the 1919 figures and those of 1921 showing an increase of 378,525 pairs a day is not out of range considering the trade conditions resulting from the world war.

MAXIMUM CAPACITY OF SHOE MANUFACTURERS IN THE UNITED STATES—PAIRS PER DAY—1919

California	4,965
Connecticut	2,500
Georgia	1,500
Illinois	60,345
Indiana	5,800
Iowa	6,850
Kansas	550
Kentucky	6,450
Louisiana	4,224
Maine	85,410
Maryland	9,725
Massachusetts	587,553
Michigan	11,000
Minnesota	15,340
Missouri	63,250
St. Louis	137,800
Nebraska	1,000
New Hampshire	112,142
New Jersey	32,195
New York	295,570
North Carolina	572
Ohio	63,380
Cincinnati	43,800
Oregon	235
Pennsylvania	118,581
Tennessee	5,500
Texas	124
Utah	220
Virginia	11,325
Washington	1,454
West Virginia	1,700
Wisconsin	60,415
Total pairs per day	1,751,475

There is a considerable disparity between the above figures and those which follow. The latest report of the United States Bureau of Census, however, is undoubtedly authoritative. This latest census is the more valuable because it shows the years 1914 and 1919 by comparison and also shows the diversified products. The total shoe production for the year 1919 figured on a 250-day basis shows an average production of 1,322,577 pairs per day. This you will note is very close to the figures mentioned in my first deduction and also close to Mr. Montgomery's figures when due allowance has been made for deductions from capacity output. The reader will readily note that the production of 1450 establishments during the year 1919 totalled 330,644,202 pairs of shoes as compared with 1,355 establishments in the year 1914, producing 292,666,468 pairs. The increase in factories was 95 while the increased production was 37,977,734 pairs over the five-year period. The figures given show the production in the ten leading states individually and also the classifications of footwear produced.

The following figures taken from the preceding table will enable many to get at the pertinent items without delay:

PRODUCTION OF BOOTS AND SHOES FOR 1919
United States Census Report

Total, All Classes	Boots and Shoes, Pairs	Slippers, Pairs	Net, Pairs
Men's	95,036,384 }	3,302,086	118,237,730
Boys' and Youths'	26,503,432 }		
Women's	104,783,205 }	5,264,235	148,057,673
Misses' and children's	48,538,703 }		
All other pairs all classifications	55,782,478	15,476,763 (Infants' shoes)	40,305,715
	330,644,202	24,043,084	306,601,118

By deducting the slippers and infants product from the total, we obtain a fair idea of the product to which rubber heels *may* be applied. Slippers may or may not carry rubber heels, but the tendency is to apply them on comfort styles and leave them off the fancy and dress varieties.

SHOE MANUFACTURERS' DEMAND

The above net figures indicate an average daily production of 1,226,404 pairs of shoes to which rubber heels may be attached, figured on the basis of 250 factory working days in the year. It is unreasonable to suppose that every shoe will carry a rubber heel and to get at the actual demand some deduction should be made from these figures. Just what the percentage of demand is, can be best expressed by saying that shoe authorities vary in their opinions. Some say as high as 75 per cent while others put it as low as 60 per cent. A very large distributer of men's shoes stated that his particular sales were running as high as 95 per cent rubber heeled shoes while a prominent manufacturer of substantial shoes for women maintained that his factory was using 1,000 pairs of rubber heels a day to be placed on the 1,000 pairs of shoes which

UNITED STATES CENSUS FIGURES ON LEATHER SHOE PRODUCTION—1914-1919

	Census Year	Number of Establishments	Total Number of Pairs	Boots and Shoes (Number of Pairs)					Slippers (Number of Pairs)			
				Total	Men's	Boys' and Youths'	Women's	Misses' and Children's	Total	Men's, Boys' and Youths'	Women's, Misses' and Children's	All Other Pairs
Entire country	1919	1,450	330,644,202	274,861,724	95,036,384	26,503,432	104,783,205	48,538,703	8,566,321	3,302,086	5,264,235	47,216,157
	1914	1,355	292,666,468	[1]250,165,497	98,031,144	22,895,719	80,916,239	48,322,395	17,733,689	3,666,972	14,066,717	[2]24,767,282
Massachusetts	1919	492	116,944,018	102,389,856	39,610,259	5,517,399	45,251,383	12,010,815	5,620,573	2,364,668	3,255,905	8,933,589
	1914	464	115,224,383	98,009,176	44,750,716	8,318,252	32,295,781	12,644,427	11,799,532	3,061,796	8,737,736	5,415,675
New York	1919	340	62,246,321	42,735,998	14,266,093	6,571,423	14,267,275	7,631,207	957,024	263,408	693,616	18,553,299
	1914	235	38,798,158	29,108,742	9,923,488	2,590,175	12,021,725	4,573,354	1,301,509	108,531	1,192,978	8,387,907
New Hampshire	1919	82	22,700,694	21,873,826	10,586,507	3,651,685	4,491,754	3,143,790	352,498	(3)	352,498	314,565
	1914	55	24,659,886	22,768,546	11,048,926	4,010,136	3,773,648	3,875,836	1,674,374	159,872	1,514,502	276,966
Pennsylvania	1919	128	23,617,362	17,909,498	2,117,680	1,192,017	3,869,766	10,730,035	817,240	128,000	689,240	4,890,624
	1914	131	22,184,502	17,717,591	1,697,909	1,230,664	3,672,662	11,116,356	312,334	(3)	(3)	4,154,577
Missouri	1919	54	26,367,397	25,457,052	8,399,403	2,294,733	10,256,064	4,506,852	(3)	(3)	(3)	862,097
	1914	49	20,868,352	20,444,240	8,840,578	749,018	6,758,611	4,096,733	102,422	(3)	(3)	(3)
Ohio	1919	60	17,870,148	17,571,593	898,507	1,804,699	12,157,284	2,711,103	.....	.....	.....	298,555
	1914	62	17,973,441	17,161,199	1,419,925	1,734,957	10,966,825	3,039,492	662,456	(3)	(3)	149,786
Maine	1919	39	19,175,382	10,444,825	3,319,890	1,235,043	5,343,009	546,883	(3)	(3)	(3)	8,689,543
	1914	50	15,709,277	12,704,966	4,476,245	572,980	4,256,166	3,399,575	(3)	(3)	667,239	(3)
Wisconsin	1919	62	11,142,456	10,490,408	6,340,008	1,894,94[illegible]	1,578,289	677,163	51,266	13,522	37,744	600,782
	1914	61	8,382,882	8,017,963	5,000,827	865,138	1,336,525	815,473	135,999	21,515	114,484	228,920
Illinois	1919	51	10,638,609	10,145,573	3,576,329	904,153	3,013,743	2,651,348	95,880	85,380	10,500	397,156
	1914	47	8,292,659	7,370,553	3,934,629	1,058,239	1,625,866	751,819	246,835	49,140	197,695	675,271
New Jersey	1919	36	4,280,660	2,678,541	580,137	(3)	436,200	1,662,137	(3)	(3)	(3)	1,596,117
	1914	42	6,112,974	3,738,459	596,830	4,438	611,980	2,525,211	196,842	17,882	178,960	2,177,673
All other States	1919	136	15,666,150	13,154,554	5,341,481	1,437,332	4,118,438	2,267,370	671,840	447,108	224,732	2,079,430
	1914	159	14,459,954	13,184,062	6,340,771	1,762,722	3,596,460	1,484,119	1,301,386	248,236	1,463,123	3,300,507

[1]Exclusive of 2,351,106 pairs of fiber shoes included with "all other pairs."
[2]Includes 2,351,106 pairs of fiber shoes not segregated as to kind and 15,476,763 pairs of infants' shoes and slippers.
(3) Included with "all other states" to avoid disclosure of individual operations.

they made daily. Therefore if 25 per cent is deducted from the daily production figures a fair estimate of the daily demand for rubber heel footwear may be obtained. Pursuing this line of reasoning, the net demand would be 919,803 pairs of heels daily.

At the present time, makers of women's shoes are using a great many wooden heels. Now it is an honest admission that a wooden heel does not lend itself to rubber heel application too readily and thus it comes about that should the range of styles in another season swing over to a greatly increased use of leather heel shapes—fiber bases and rubber toplifts—the rubber heel demand would be very heavily increased among manufacturers of women's shoes.

SHOE FINDERS AND CHAIN STORE OUTLETS

When the volume of product devoted to the shoe findings trade is considered, some very interesting facts are disclosed. There are fourteen important associations of shoe finders headed by a National Shoe Finders' Association which claims a mailing list of more than 40,000 active shoe repairers' names. An authority on the repair trade of the United States claims there are 50,000 active shoe repair shops in the United States today. The shoe finder is the wholesale distributer who supplies all these repair shops with rubber heels and other supplies. The importance to him of the rubber heel industry is shown when it is known that fully a third of his total volume of business for the year is comprised of sales of rubber heels. In order of prominence the three largest items in the shoe finders' sales mentioned are leather, rubber heels, shoe laces. It is fair to assume that most people who purchase shoes with rubber heels attached are likely to have new ones applied when the first pair is worn out. It is very safe to assume that each wearer of shoes with rubber heels has on an average one more pair attached during the life of those shoes so that if 306,601,118 pairs of shoes with rubber heels are produced each year, just that many additional heels must be made for the shoe findings trade to care for replacements.

One should not think lightly of the trade in rubber heels made possible by the chain stores of the country. Boyd's list contains more than 3,000 names in the 5 and 10-cent class and several hundred more which retail goods up to 25 cents in price. In order to get first-hand information regarding the quantity of heels sold in an individual store, the local 5 and 10-cent stores in a Boston suburb was visited. During the period January 3 to July 17, 1921, this store ordered 22 gross pairs of rubber heels, and at the same rate would use 6,336 pairs a year or about 21 pairs a day considering 300 days in the chain-store year. This multiplied by the 3,200, the number of chain stores in the country, gives the very interesting total daily consumption of 67,000 pairs a day.

Having considered each of the three possible outlets for the sale of rubber heels, a composite look at the figures unearthed by deductions and facts is in order.

TOTAL ESTIMATED DEMAND FOR RUBBER HEELS

	Pairs Per Day	Days Per Year
Shoe manufacturing trade	919,803	250
Shoe findings, jobbers	1,922,004	300
Chain store demand	67,200	300
Total daily demand	2,909,007	

This means a total yearly volume of approximately 600,000,000 pairs. Compare this demand with present production: The entire rubber heel production as stated by the United States Census Bureau was 126,572,000 pairs, valued at $14,238,000. These are authoritative figures.

If overindulgence in optimism is shown by the demand for 600,000,000 pairs a year, reduce it one-half and even then there are not enough heels to supply one-half of half the demand. In other words, there may be as many more heels manufactured during 1922 as have been made in 1921 without any fear of overproduction.

Another very interesting comparison appears from these census figures. The average price of the heels produced in 1919 was more than 11.2 cents a pair. This must be the retail sales value because the average price today is far below this figure. In fact the top of the market today is 13 or 14 cents a pair for men's heels.

AN IMAGINARY HEEL FACTORY

In order to get another and different viewpoint on these figures, imagine a factory built and equipped to produce all these heels and see what would be required to keep pace with the demand. Only the press room need be considered, and this is equipped with 30-inch hydraulic presses having 3 openings and using molds 25 by 26 inches. Cures are theoretically standardized to 15 minutes and a wizard of a press-room foreman will obtain four heats an hour and work this factory 10 hours a day without any slip-ups. Averaging the mold capacity at 90 cavities a mold, the output on the above specifications will be 10,800 pieces for each press daily, or 5,400 pairs of heels for each press daily, and it will require only 540 presses to take care of the daily demand of 2,909,007 pairs. There will be an average of 12 washers for a pair of heels and thus the pressmen are going to handle a few more than 34,808,084 washers a day. The heels will be trimmed by machines which will average 2,000 pairs a day. The wizard at the head of the trimming department will have to keep 1,485 trimming machines going at full speed to do the work. Rubber machinery men can now determine how much would be invested in new machinery for this imaginary factory. Specialists can figure out the corporations tax return to the Government but one and all will agree that it is some proposition after all.

SHOE MANUFACTURERS CONVINCED

There was a time when the shoe manufacturer did not care to bother with rubber heels but just as thousands of people have come to demand them in their daily walk, so have shoe manufacturers come to use them in their daily factory production. The most important factors which have brought about this change, that came at about the time we were entering the war, are the methods of attaching rubber heels by machines, similar to the prevalent practice of attaching leather heels, and the saving in cost of rubber heels over those of leather. Top lifts, as the top lift of leather on a heel is called, became very expensive and poor in quality. Shoe manufacturers were quickly convinced that a rubber top lift 3/8 or 1/2-inch in thickness could take the place of a top lift of leather which cost 11 or 12 cents a pair, and two under lifts as well, which cost an additional 5 or 6 cents. Such a rubber heel could be bought at prices which were a genuine saving besides conserving much leather that was badly needed for war uses. At this time also, it was considered good practice to use a whole rubber heel 5/8 to one inch in heighth, which was cupped on the under side to fit the shoe bottom accurately and requiring no under lifting. The shoe trade now seems to prefer the half heel, but the whole heel is finding new favor in heavy work shoes and for children's shoes.

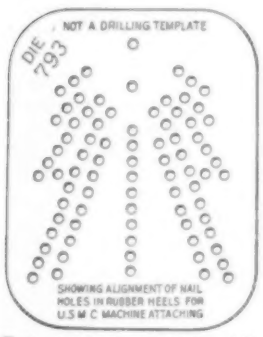
RUBBER HEEL NAILING MACHINES

Shoe manufacturers quickly recognized these advantages and began to use rubber heels in large quantities but the heeling departments became crowded with shoes which could not be heeled fast enough and it was quickly seen that something ought to be done to care for this work. As if in anticipation of this condition, an attachment was perfected for use on several types of leather-heel nailing machines which would nail rubber heels about as fast as leather heels could be nailed.

One type of heel-nailing machine which will nail rubber heels as easily as leather is shown on the title page. In operation, the loader arm is filled with nails and moved over the bed. By a clever device the nails are fed into proper holes in the bed and held there. The shoe is placed on the jack and swung in under the heel-locating plate where it is rigidly clamped and cannot vary. The driver descends and drives all the nails at one blow. A different driver-plate and adjustment is necessary each time the size of heel is changed. The simplicity of this operation is known, however, when one can do 1,000 pairs of shoes per day on this machine. One man operates the machine and a boy feeds the nails into the loader arm.

THE STANDARD TEMPLATE

This standard template is the nearest approach to standardization of heels and toplifts that has ever been devised, but it should be borne in mind that it is a standard template only for the *nailing* of the heels and thus affects only the location of the washer pins in the molds. The template and the driving head in the nailing device are similarly bored to receive the drivers so that any combination of nails arranged for driving within the spacing limits of this template may be driven with one single operation. One other necessary part of this rubber heel nailing device is a registering or "ring" plate which slides into place easily and is recessed to receive the heel for nailing, the while holding it in proper position so that when the driver descends the nails will be in exact position for driving, and the heel will be exactly located for proper position on the shoe.



THE STANDARD TEMPLATE FOR RUBBER HEELS. RELATES ONLY TO LOCATION OF WASHER OR NAIL HOLES. HAS NOTHING TO DO WITH SHAPES OR STYLES OF HEELS.

In factories where the output is fairly regular in type, it is possible for an experienced operator to nail 1,000 pairs of shoes a day, whereas, it would have required several operators to nail the same number of heels in the old hand way. An additional merit is found in the fact that the machine nailing gives each nail the same drive and clinch and thus the finished heel is exceptionally even in appearance.

CONICAL WASHERS INTRODUCED

With machine nailing, however, came a need for a new kind of a washer. The flat washer which has been used since heels were first produced was all right provided the heels were very accurately molded and provided that each nail hole was in the place designed, but with the shrinkage of compounds and slight variations in mold cavities, it was often found that the drivers would not exactly hit the nail holes but would instead strike the washer and break the heel and very likely the drivers as well. The conical washer needs no technical explanation for one may easily see that if the driver struck the conical side of the washer its slanting surface would simply guide the driver to the hole location. This washer is expected to take care of a variation in nail location of at least 1/32 of an inch. When heels vary more than this, there is something radically wrong and it must be corrected.

Besides saving waste of heels, this washer prevents loss of operating time and in most factories heels with flat washers will not be accepted for machine nailing under any circumstance. At the present time machine nailing of rubber heels is practiced mostly in factories making men's shoes, but it is equally well-adapted for women's work. Just why there should be any lesser usage here is not clear unless it is because women's heels present a much more complicated matter with regard to sizes and styles and the machine adjustment and changes would be more frequent.

OPPORTUNITY IN HEEL MANUFACTURE

There is plenty of room today for rubber manufacturers to enter the rubber heel field which is particularly inviting for well-organized plants. Rubber heel factories are busy and several new organizations that have entered the field recently have found no difficulty in getting their full quota of business almost from the start. As to product, there is plenty of room for heels of varying prices so long as good value is given. In men's heels the prices to shoe factories run as low as 5½ cents a pair, but at this price it is hardly possible to offer exceptional quality. A low price of around 7 cents is much nearer the correct low figure and from this there is a market for men's heels priced up to 10 and 12 cents a pair. No manufacturer should enter the rubber heel field with only his rubber experience as a guide. The most careful shoemaking advice together with rubber knowledge is very essential for success. A good rubber heel might be designed by a novice, yet be entirely unfitted for use in the shoe field from a practical standpoint. There are numerous cases in point where much money has been wasted and a great deal of time and effort lost because a worthy product was not built around the practical lines demanded by the trade.

PERTINENT POINTS

It is possible to get a rather varied product with the standard nailing template if it is not used correctly and there are a great many other points which should be definitely determined before placing a line of heels on the market. A few of these points may serve as a guide to any who are seeking preliminary information of this character. With regard to color, black should be non-blooming, and in the tans there are some colors that are taboo and some that are especially desirable. A certain amount of flexibility in tan shades is desirable as from time to time trade practice demands a change. White must be as near the real color as it is possible to get without increasing the gravity to an extreme point. The cup—meaning the depression in the underside of the heel—must be right or the finished heel will not lie flat on the shoe. If cupped too much, it will hollow out and if too little, it will round up. It is very expensive to make over a set of equipment that is wrongly designed. Some cups are deeper at the front of the heel than at the back. The rand is a term applied to the outside edge of the cup. If this is not given the right bevel the heel will never fit accurately and the finished shoe will show a broken joint where the rubber heel joins the leather. The breast is a term given to that part of the heel that is nearest the front. Some are too rounding and others are too square, while some have a vertical breast and others are pitched. Consider the trade demands before making these molds, especially in women's heels. The bevel on the edge is another important point in women's heels which should grade from one size to another.

It is the writer's personal opinion that freak heels are not money makers. A résumé of the patented "feature" heels which have appeared in the last twenty years reveals the fact that few, if any, are paying dividends now. This does not apply to special copyrighted designs, but to such types as interchangeable heels, washerless heels, heels with pneumatic suction cups underneath, etc. With about 200 varied designs now on the market, it will not be easy to find a design that suits one's ideas and yet fits the demands of the trade. Every now and then a new design comes out that is immediately approved but one can wager that such designs did not grow on trees—some one had to dig for them.

"RE-NU-R" PRODUCTS

This line contains dressings, patches, cement, canvas waterproofing, and white tire plating. Leather Re-Nu-R is a dressing for renewing the black luster of leather, imitation leather and rubber composition fabric tops. Mohair Re-Nu-R is for leaky mohair tops, as it renews the rubber tissue between the fabric and mohair cloth, and is a lasting black color. Rubber top Re-Nu-R is made of rubber composition especially for rubber fabric tops. It is soft, pliable, and not affected by climatic conditions. The Re-Nu-R top patches are composed of mohair, pantasote and rubber, holding firmly and requiring no tools other than a knife or scissors in applying. Re-Nu-R top cement is made of rubber products for general automobile top work. Re-Nu-R canvas waterproofing is a rubber composition for use on tents, awnings and wagon covers, to prolong the life of the canvas. Rubber Re-Nu-R or white tire plating revives and renews rubber tires, mattings and all other rubber articles, while filling small cuts and keeping water out of the fabric. Mendem rubber patch, or rubber back, is a tire repair and efficient household patch for repairing anything of rubber without heat or tools. Re-Nu-R rubber cement is a cold-cure patching cement, for inner tubes and all other rubber materials.—The Re-Nu-R Products Co., 204 East Lake street, Minneapolis, Minnesota.

A Glossary of Words and Terms Used in the Rubber Industry—IX[1]

By Henry C. Pearson

Pneumatic Tire Definitions[2]

OFFSET VALVE. A valve having one or more bends in the stem to fit a slot or depression in the wheel rim. See Valves.

ONE-PIECE RIMS. Rims for clincher or soft-bead tires, having the flanges incurving to grip the tire beads. See Rims.

ONE-PIECE TUBE. An endless inner tube. See Molded Tube.

OPEN CURE. Vulcanization where a heated fluid or vapor is brought in direct contact with the object to be cured. See Vulcanization.

ORNAMENTAL DESIGNS. The classification given to tire tread designs by the United States Patent Office to clearly segregate them from ordinary trade marks.

OUTER CASE CEMENT. A self-curing compound for repairing worn places on cycle tires. See Cements.

OUTER TIRE. A light weight casing with tread, and without beads fitted over and cured to a damaged tire.

OUTSIDE BOOT. See Boot.

OUTSIDE HOOK-ON BOOT. See Boot.

OUTSIDE LACE-ON BOOT. See Boot.

OVERCURE. Excess vulcanizing in manufacture or repair. See Vulcanization.

OVERINFLATION. Forcing air or gas into an inner tube in excess of what is required as indicated by tire size and load.

OVERLOADING. Placing of greater weight on tires than their size, construction, or air capacity can safely sustain.

OVERSIZE. A tire larger in cross-section and in tread diameter than the standard size for a given rim, affording increased tractive grip and greater air cushion: as a 29 by 3½ for a 28 by 3 tire. The rule for oversize is to add ½-inch to the smaller factor—as 3 in the first instance—and 1 inch to the larger factor—as 28 in the same case—the addition giving the proper oversize.

OVERSIZED TUBES. Inner tubes of extra dimensions suitable for oversize tires.

PAD AND CLAMP METHOD. A mode of vulcanizing repairs in tires, the inside pressure being imparted by a sand bag and clamps.

PAINT. (1) A solution used on the inside of a finished casing to prevent adhesion of the inner tube to it. (2) A rubber-base, elastic varnish used for coating casings between the tread and rim to prevent checking and preserve sidewalls. (3) A metallic-base liquid used for coating rims to prevent rust.

PALMER ALL-WARP TIRE. See All-Warp Tire.

PALMER CORD CASING. See Cord Tire.

PAPER WRAPPING. The final operation after inspection in tire making in which the casing is closely taped with a narrow strip of paper, wound spirally in one or more layers, to preserve the tire against soiling, effects of light, grease, etc., while in storage or during shipment.

PASSENGER TIRES. A trade term designating the automobile pneumatic tires most largely used on so-called pleasure vehicles.

PATCH. A piece of rubber, or rubber and fabric, used to repair a damaged part in tube or casing. A plaster. See Cementless Patch, Blowout Patch, All Rubber Patch, and Repair.

PATCHING CEMENT. An air-drying rubber solution for attaching impression pads temporarily to casings in retreading. See Cement.

PEELER. A good grade of ordinary American upland cotton. See Cotton.

PEELINGS. A reclaimer's term applied to (1) rubber stock free of fabric, cut from tread and sidewalls of discarded tires, and to (2) stock containing breaker and some building fabric.

PERFORATING. Piercing blisters to allow exit of air.

PIN-HOLES. Minute open spaces or perforations in single layers of inner tube stock; usually overcome by laminating the various layers of the sheet gum. See Porosity.

PINCH-PREVENTING BLOWOUT PATCH. An inside blowout or rimcut patch made of several layers of frictioned fabric with double flaps to fit over the beads of a casing, and with soft rubber ends to prevent pinching of the inner tube; also made of the same materials and to fit over and encircle the inner tube.

PINCHING. A carcass trouble in which a tire cured by the full-mold process is, while in a plastic state, displaced and pinched between the upper and lower halves of a mold. Also an inner tube injury. See Nipping.

PLAIN TREAD. A smooth-surfaced crescent-shaped tread. See Treads.

PLASTERS. See Patches.

PLASTIC. See Dough.

PLIES. Layers of rubberized fabric, cord or cable, used in building or repairing a tire carcass.

PLUGGING CEMENT. An elastic, adhesive rubber compound cement, of heavy consistency and quick-drying quality, for filling punctures in single tube tires. See Dough.

PLY-GAGE. The thickness in inch fractions of a ply of tire fabric.

PNEUMATICS. The branch of physics treating of the mechanical properties of air, and gases generally, as density, pressure and elasticity; also colloquially safety bicycles fitted with pneumatic tires; also, pneumatic tires.

POLE-BUILT TIRE. A single tube bicycle tire made by wrapping the materials around a mandrel; distinguished from a "drum-built" single-tube tire, in which the operation consists in building over a drum.

POROSITY. A trouble incident to curing tires, especially in repair work, in which a trapped gas forms, causing a pitted or spongy surface.

POROUS TIRE. A slow-leaking single-tube tire, which has been so injured as to allow air to travel through the fabric and gradually induce deflation.

"POST MORTEMS." A trade term for adjustment examination by manufacturers of tires returned to them as having failed to give a normal term of usefulness; usually conducted in a special factory department by experts in tire analysis and construction, familiar with the varying conditions of tire use and abuse.

POT CURE. See Kettle Cure.

POWDERED CEMENT. A pulverized composition—usually a proprietary preparation—used in retreading and other repair work as a substitute for liquid vulcanizing cement, and which becomes adhesive under heat.

PRESERVATIVES. See Paint.

PRESSURE. (1) Air or gas under compression in a pneumatic tire. See Inflation. (2) Compression employed with heat in vulcanizing tires or in repair, utilizing air, steam, or mechanical stress.

PRESSURE GAGE. A self-registering instrument for indicating the degree of inflation of inner tubes. See Valve Gage.

PRICE GUARANTEE. A pledge of protection against loss on goods purchased in the event of a subsequent reduction in prices.

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[1] Continued from THE INDIA RUBBER WORLD, October 1, 1921, pages 7-9.

PROTECTOR. A canvas or leather wrapping laced about a tire. See Boot.

PULLED AUTOMOBILE FABRIC. A reclaimer's term applied to single or multiple-ply fabric from discarded tires.

PUNCTURE. A hole or breach made in a tire by a sharp object.

PUNCTURE FLUID. A heavy liquid made of rubber, glue and glycerine, or other material, injected into the tube of a tire to stop leaks.

PUNCTURE-PROOF. A tire or tube constructed to resist puncture.

PURE GUM TUBES. Inner tubes made of rubber and a vulcanizing ingredient. See Floating Tubes.

QUARTER SECTION REPAIR. A casing repair of a rimcut or a broken bead. See Repair.

QUICK-CURE CEMENT. A rubber cement compound for rapid vulcanizing. See Cement.

QUICK-CURE GUM. A rubber plastic for repairing, so compounded as to cure in from 5 to 10 minutes.

QUICK-DETACHABLE CLINCHER TIRE. A quick-detachable tire adapted to fit clincher rims.

QUICK-DETACHABLE RIM. A separable or constrictive rim so constructed that the tire may be quickly and easily removed. See Rims.

QUICK-DETACHABLE STRAIGHTSIDE TIRE. A quick-detachable tire adapted to fit a straightside rim.

QUICK-DETACHABLE TIRE. A tire made to fit a quick-detachable rim. See Rims.

RAISED TREAD. A tire having a tread with a pattern in relief designed to secure better traction.

RASPING. Roughening a tire to make cement adhere. A repair term.

REBUILT TIRE. A damaged or worn casing made over so as to simulate in appearance and usefulness a new casing.

RECLAIMED FABRIC. Sound plies of rubberized fabric stripped from damaged tires.

RECLAIMED RUBBER. Vulcanized rubber treated by mechanical and chemical processes for reuse in rubber compounds.

RED TUBES. Inner tubes having a red coloring imparted by compounding ingredients.

REENFORCED LININGS. See Reliners.

REENFORCED TUBE. An inner tube strengthened with one or more plies of fabric.

REENFORCEMENT. Affixing a patch or inserting a fabric section in a weakened casing interior.

REENFORCING VALVE PATCH. A perforated patch of thin, compounded sheet rubber, oval-shaped, with one or more smaller ovals of fabric, designed to secure a valve stem.

REGULAR SIZES. Tires conforming to the size standard schedule adopted by the Society of Automotive Engineers, as distinguished from oversize tires. See Sizes.

RELINER. A strip made of two or more layers of fabric cemented together, feather-edged, and crescent-shaped to fit snugly inside a casing, and used to protect the inner tube.

RENOVATION. Replacing damaged portion of tread or carcass with new material.

REPAIR. To mend or restore to a sound condition after injury or partial destruction; as applied to tires and tubes, to correct damage resulting from various causes.

Bead Repair. Repair or replacing of misplaced, damaged, or broken beads.

Carcass Repair. Replacing of damaged plies or cords in fabric, cord fabric, or cord tires.

Factory Repair. Repair effected by the tire manufacturer whereby tires scarred or slightly damaged in the process of manufacture or returned for adjustment, are made marketable as seconds.

Inner Tube Repair. The mending of punctures, tears, leaky valves, or replacing of damaged sections in inner tubes.

Road Repair. The application of temporary appliances as boots, or the repair of cuts or punctures by use of emergency kit materials.

Shop Repair. Work done by repair men or vulcanizers on tubes or casings.

Single-Tube Repair. Repairing punctures or tears in single-tube tires, usually effected by the insertion of self-vulcanizing dough, or by plugs affixed by self-vulcanizing cement. See Dough.

REPAIR EQUIPMENT. Apparatus and tools used by tire repair men. In general vulcanizers, molds, buffing appliances, rollers, stitchers, tread rollers, splicing mandrels, knives, shears, gages, cement containers, etc.

REPAIR MATERIAL. Rubber, rubberized fabric, cement and curing solutions used in the repair of tubes and tires; as patches, reliners, compounded sheet rubber, coated and frictioned fabric, tread stock, bead fillers, valve bases, vulcanizing and cold cure cements, dough, acid solution, etc.

REPAIRABLE DEFECTS. (1) Casings—tread and ply separation, stone bruises, blowouts, rimcuts, worn tread, treadcuts, sand blisters, scraped sidewalls; (2) tubes—blowouts, valve-patch breaks, tears, punctures, leaky splices.

REPAIRABLE TIRES. Discarded tires capable of being salvaged; graded as No. 1 inners or good stripped carcasses, No. 2 inners with only one blowout, and ordinary repairables, with two or more blowouts.

REPAIRED TIRES. Damaged casings which have been made serviceable by mending.

REPLACEMENT. See Guarantee.

RERUBBERING. See Retread.

RESILIENCE. An essential springy, shock-absorbing quality or attribute of the pneumatic tire, afforded mainly by the air-inflated inner tube.

RETREAD BANDS. See Tread Bands.

RETREAD, RETREADING. The restoring to serviceable condition of a tread damaged by road use. See Built-Up Tread, Camelback and Layback Section.

RIBBED SIDES. Tires having ridges molded on their sidewalls to strengthen the latter and protect them against rut and curb wear.

RIBBED TREAD. A tread having two or more circumferential grooves designed to lessen traction wave and side slip.

RIM. A metal band around the circumference of a wheel, to which a tire is attached. Pneumatic tires use a great variety of rims of which the following are the most common and most nearly standard:

Bicycle Rim. Wood or metal outer bands of a bicycle wheel, with (1) a concave channel into which a single tube tire is cemented, (2) having incurved flanged edges to grip the beading at either side of a tire of the single clincher type, or (3) a flat-cut or recessed channel for a tire with double beading as in the double-clincher type.

Clincher Rim. A rim consisting essentially of a flat base or tire seat with incurved flange at either side, into which flanges the bead of a clincher casing hooks. Such full-circle, double hooking is made more certain by the inner diameter of the clincher tire being slightly less than the rim diameter on which the tire rests, and by the pressure of air within the tire.

Demountable Clincher Rim. A rim, often of the transversely split type, adapted for tires of the clincher type and attached to a wheel felloe with easily-removable wedges or clamps secured with bolts and nuts.

Demountable Truck Rim. Rims adapted for use especially with giant pneumatic tires; a much used type employing a solid or continuous base with a continuous, removable side ring to hold the tire, and a transversely cut ring to lock the side ring or movable flange holding the tire.

Quick-Detachable Demountable Rim. A rim embodying the advantages of both easy removal of a tire and quick demount-

ing of the rim from a wheel band. Made in many patterns, but generally in plain clincher, straightside continuous and split-band types, utilizing clamps, locking and clamping rings, clamp brackets, bolts, nuts, and washers.

Quick Detachable Rim. Originally a rim for a tire of the clincher type but with non-elastic beads, the tire being held in place by a permanent flange on one side and a removable, bolted-on flange on the other, allowing quick detaching by removal of the ring-like flange.

Ringed Rim. A rim with side and lock rings, such as are used with straightside tires.

Slotted Rim. A rim used for pneumatic truck tires having a narrow U-shaped slot from the edge to the center of the rim base to permit the easy attachment or removal of an inflated tire by allowing the valve to slide into or out of place without being forced over the rim edge.

Split Rim. A rim cut squarely or diagonally across its surface to permit the contraction of its diameter by temporarily overlapping either end with the other and thus facilitating the application or removal of a pneumatic tire; always provided with a self-contained locking device. Also a similarly opened rim used for mounting tires in the open vulcanizing process.

Straightside Rim. A rim with a flat base and upright and outcurving flanges designed to hold straightside, inextensible-bead tires. Tires are placed on the rim base either by having the rim split so that it be made temporarily of smaller circumference so as to sit easily within the center of the tire, or by removal of flange side and locking rings. The sole function of the flanges is to prevent the tire from slipping off the side of the rim, the tire with its rigid bead and greater inflation having ample circumferential grip.

Straightside Split Demountable Rim. A demountable rim diagonally or transversely cut through its base, permitting its contraction to fit within a tire; fitted with a base-locking device, and held to the felloe band with a clamping ring, clamps, bolts, and nuts.

Universal Rim. A development in rim construction following the straightside and combining the features of the latter with those of the quick-detachable, so as to hold either straightside or q. d. clincher tires. Tire interchangeability is effected by sliding off and reversing the curved ring flanges on the rim base, and fastening by means of a third or locking ring. With a standard type of universal rim a tire may be changed without demounting the rim from the wheel.

Valve-Offset Rim. A rim used for pneumatic truck tires having a narrow, shallow depression from the edge of the center of the rim base—instead of a cross-wise aperture as in a slotted rim, to allow for easily changing an inflated tire with an off-set valve, the valve coming out at the edge of the rim; used to avoid weakening a rim by slotting and to facilitate tube inflation. See Valve.

RIM CEMENT. See Solid Cement.

RIM PAINT. A metallic-base paint applied to steels rims of wheels to protect the rubber tire against damage by rust.

RIM SIZE. The diameter required for a given size of tire, found by deducting the smaller factor in the tire size, doubled, from the larger factor, for example, in the case of a 34 by 4 tire, twice 4 equals 8, which, deducted from 34, gives a rim size or diameter of 26 inches.

RIM STAMP. A symbolic design typifying a rim contour or section and branded with a steel die upon the base or channel of a rim which in figure, measurement, etc., conforms to the specifications of the Tire and Rim Association. The three designs shown here are used on rims thus approved, and pneumatic tire manufacturers refuse to extend their guarantee to tires used on rims other than those bearing these standard marks:

1 2 3

1. For rims not transversely split (solid).
2. For transversely split rims (non-continuous).
3. For wire wheels.

RIM STANDARDIZATION. A movement toward eliminating irregular rim construction and establishing practical types of precise measurement, begun in 1910 by the United Rim Co., which brought out the Standard Universal rims under many patents; continued in 1913 by the Society of Automotive Engineers, supplemented in 1918 by the survey of the industry and recommendations of the War Service Committee of the Rubber Industry of the U. S. A. in cooperation with the Tire and Rim Division of the S. A. E., and approved by the directors of the National Chamber of Commerce. For standard practice the use of the straightside type of rim was urged for all sizes except the 30 by 3 and the 30 by 3½, for which the clincher type was to continue.

RIMCUT. A break in the tire carcass near the bead, due to rim chafing, pinching, overstraining, underinflation, or misapplication.

RIMCUT PATCH. See Patch.

ROAD BUFFING. See Alinement.

ROAD-WORN TIRES. Tires that have their treads worn through, exposing breaker strip or fabric plies.

ROLLED TUBES. Inner tubes formed by rolling thin sheets of rubber around a tube or mandrel until the wall is of the desired thickness.

ROPE CONSTRUCTION. See Cord Tires.

ROUGH TREAD. A tread which has its surface marked with elevated or depressed non-skid designs.

ROUND TREAD. A tread showing a crescent shape in cross-section and with unmarked surface.

RUBBER-LINED TIRE. A casing, the inside of which has a rubber coating to prevent wear on the tube.

RUBBER-STUDDED TIRES. See Bailey Tread.

THE NEW YORK ELECTRICAL SHOW

THE 14th annual New York Electrical Show was held September 28 to October 8, 1921, in the 71st Regiment Armory. The exhibits, nearly one hundred in number, were effectively displayed under an artistic decorative scheme of electric lighting and illuminated signs.

The purpose of the exposition was to present to the public electrical devices and apparatus to accomplish efficiently hundreds of tasks formerly done by hand. In large part the display consisted of electrical appliances for every branch of household work and economics, a veritable "servant in the house." The number of devices for lessening the labor incident to housekeeping is constantly increasing as new applications are developed.

Practically every piece of electrically operated apparatus depends for current connection on rubber-insulated, flexible cord and many also embody the use of hard and soft rubber in many special applications as hose, gaskets, washers, rings, tires, rolls, hard rubber fittings, battery boxes, etc.

The Electrical Testing Laboratories featured the testing of electrical appliance cords as conducted under the auspices of the National Electric Light Association Wiring Committee. The testing machine in actual operation determines the relative durability under continuous reversed bending and under continuous abrasion. Bending tests of this type have shown a variation of 118 to 1 between good and bad samples, while abrasion tests have shown a variation of 34 to 1 between good and bad samples.

The Westinghouse Electric & Manufacturing Co., Pittsburgh, Pennsylvania, displayed an automatic electric range together with a complete line of electric appliances and electric fans. The feature of the exhibit, however, is a complete radio receiving station entirely equipped with Westinghouse apparatus.

National Safety Council

Meeting of the Rubber Section

THE Tenth Annual Congress of the National Safety Council was held in the State House, Boston, Massachusetts, September 26 to 30, 1921.

It is estimated that, through effective safety work as promoted by the National Safety Council through its various sections, a billion dollars a year can be saved to the industries of this country by the prevention of the 20,000 deaths caused annually by industrial accidents.

The problem of maintaining effective safety work during the present business depression and accomplishing this enormous saving, more important to industry than ever before, during these times when every possible economy and retrenchment is being made, was one of the main topics set for discussion at the safety congress.

The sessions of the Rubber Section were held September 27, 28 and 30. An interesting address was given at the luncheon on September 27, by H. S. Firestone, president of the Firestone Tire & Rubber Co., Akron, Ohio.

The following are abstracts of the most important papers that were read at this meeting.

SAFETY FIRST FROM THE FACTORY MANAGER'S VIEWPOINT

By Charles B. Whittelsey, President, Hartford Rubber Works Co.

The function of a factory manager is to produce an article of the highest quality in the greatest quantity at a minimum cost. The principal means at his command for producing are equipment, material and labor. He must first of all understand that safety first is an educational movement, and that from 70 to 80 per cent of the accidents in industry are due to lack of proper training of the operators.

FOREMEN

The best medium for reaching workmen is through the foremen, and therefore they must see the safety first problem clearly. But the factory manager should make sure that the foreman's education is carried still further. He must be shown the necessity of studying the personnel of his department, because congenial men work better and more carefully together.

The foreman must also realize the importance of safety first instructions from the economical standpoint; think beyond the production capacity of his men and machinery and see the human side of the question, thus proving himself not only a faithful servant of the company, but a friend to his men.

EMPLOYMENT DEPARTMENT

The employment manager can be of great assistance in reducing the number of accidents if he is thoroughly familiar with the operations in the various departments in which he is to place the men. The wise selection of employes is of prime importance; but the careless placing of light men on heavy jobs and heavy men on light jobs, the putting of men of muscle and brawn in positions where brains and dexterity are required, is a most fertile source of accidents.

FIRST AID DEPARTMENT

This department should be under the direction of medical authorities with trained nurses in attendance. Heavy losses often occur from the lack of proper first aid attention. Every injury, no matter how slight, should be reported to the department, so that it may receive proper treatment and serious results be prevented. Complete accident records and statistics show the causes of accidents, and serve as a guide in planning the safety first campaign.

SAFETY DIRECTOR

A safety director need not devote all his time to the campaign, but upon him devolves the duty of organizing a live safety first committee through which the educational work is carried on throughout the plant. Upon it rests the important work of infusing the minds of the foreman and the operators with the safety first idea and developing a spirit of hearty cooperation.

RECLAIMING PLANTS AND THEIR EFFORTS TOWARDS SAFE OPERATION

By J. C. W. Baker, Master Mechanic, Rubber Regenerating Co.

There is a similarity between reclaiming and other rubber plants, notably in the arrangement and equipment of the mill room. There, the mill operator is protected against accident by an approved magnetic, mechanical or pneumatic clutch on each mill-line shaft, with some form of brake, the clutch being thrown out and the brake engaged by the conventional trip over each mill.

The similarity is not so pronounced outside the mill room, and there are certain features connected with reclaiming that require careful consideration for safe operation. One of these is the handling of materials. Wherever possible, rubber in process is conveyed by power or by gravity, but there is always more or less trucking by hand, and this trucking and handling of materials accounted for 43 per cent of the accidents in one plant for one year. The general run of these accidents was slight, but occasionally a bad strain resulted, a foot was bruised, or a toe crushed. Many of these accidents could have been avoided by the use of electric transveyor trucks which are rapid in action and safe in operation. The inclination is to overload them; therefore it is important that the floors be sufficiently strong to carry the additional load.

Most of the raw stock is stored in the open, thus reducing the fire risk, and avoiding the use of large buildings for storage purposes. The storage pile should be served by a light traveling or stacking crane, or a mono-rail conveyor.

DEVULCANIZERS AND DIGESTERS

Devulcanizers and jacketed digesters are provided with safety valves. Digesters of the single-shell type where the steam comes in contact with the rubber and caustic, will at times, due to chemical reaction, run a higher temperature and consequently pressure than that furnished by the boilers. To protect the vessel a safety valve is placed in the entering steam pipe and close to the stuffing box; check valves between the safety and steam valves prevent the excessive pressure generated in the digester from blowing the rubber and caustic into the steam main, and thence to the boiler. The reason for locating the safety valve in the pipe rather than in the shell, is that in the former position this valve can be tested while the digester is revolving; it also keeps free from an accumulation of rubber, whereas, a valve in the shell would soon become plugged and rendered inoperative.

Revolving digesters and devulcanizers should be provided with locks to prevent their turning while being repaired or cleaned. A satisfactory lock is the ratchet and pawl type.

STRAINING MACHINES

Straining machines are provided with a straining head, which, for an 8-inch machine, weighs approximately 100 pounds. The head is screwed into the body of the machine and has to be changed several times during the course of the day for the purpose of cleaning the screen. The style of wrench used to remove the head is important. One with a friction grip, similar to a Parmelee pipe wrench, can be used with a greater degree of safety than any other style. It will tightly grip without marring the smooth cylindrical surface of the head, and as it requires no protuberances to fit over, the head can be of minimum weight, consequently more easily and safely handled.

Bucket elevators and conveyors of all kinds should be provided with locks. The usual method is to lock the belt shipper, or handle of the starter if motor driven.

AUTOMATIC APRONS

Batching and sheeting mills are now equipped with automatic aprons. In some cases mills are arranged in groups and connected by conveyors. For instance, if a certain stock requires four passes, it is fed to the first mill and automatically delivered to the other three. This arrangement, similar to the automatic aprons, dispenses with the dangerous practice of feeding by hand.

CAUSTIC ALKALI AND SULPHURIC ACID

The usual method of opening the caustic drums or containers is by means of a sledge-hammer, or pickaxe. The caustic is broken in the same manner.

Sulphuric acid is received in tank cars and is delivered to the storage tanks by gravity or by compressed air, and pumped from the storage to the boiling tanks. In all cases it is piped. Carboys or other containers with their attending danger of handling should not be tolerated.

PRACTICAL PLANS FOR MEDICAL SUPERVISION IN RUBBER PLANTS

By Dr. Robert S. Quinby, Service Manager, Hood Rubber Co.

Plans for industrial medical supervision may be considered under the following headings: (1) Physical Equipment, (2) Personnel, (3) Functions.

PHYSICAL EQUIPMENT

The dispensary should be easily and quickly accessible to all parts of the factory. Cleanliness and all requisites of good medical work may be obtained without needless expense. Relatively few standard drugs and instruments are all that are necessary. This economy will meet the approval of the management as well as the patients who are treated.

PERSONNEL

The personnel of an industrial medical department will vary with conditions. In the beginning, a nurse and a doctor on call were, in most cases, all the staff considered necessary, but with the development of industrial medicine the desirability of full-time medical supervision as well as nursing service has become recognized. A plant employing 500 or more people justifies one full-time physician. The ratio of doctors to employes in larger plants should probably be an additional physician to each 1,500 workmen. The number of nurses required will vary with the functions attempted in different medical departments. If nurses are used to visit absentees as well as take care of hospital routine, it will be necessary to have more, but I believe that ordinarily one nurse to each thousand employes is a fair ratio.

DEPARTMENT FUNCTIONS

Physical examination forms the foundation of any well-developed program of health supervision. It is the inventory of health conditions and the basis of a preventive and constructive industrial health program. Until a very few years ago physical examination of workers was looked upon by the majority of industrial managers as a questionable undertaking, but at the present time, at least in most of the larger industrial plants, it is a well-recognized part of both employment procedure and medical supervision.

The second function of an industrial medical department has to do with the treatment of different abnormal conditions. Industrial dispensaries were primarily established for the purpose of treating wounds resulting from industrial accidents, but it very quickly became apparent that disability due to sickness was as important as that due to accident, and for that reason we should provide facilities for taking care of disease as well as injury.

The factory dispensary should provide for remedying defects found as a result of physical examination; it should provide for treatment and giving of necessary advice to such workers as are taken sick during work, and should provide for the earliest possible treatment of accidental injuries.

The third function of the medical department has to do with the supervision of factory sanitation and elimination of disease hazards. We are coming more and more to realize the importance of ventilation, light, heat, toilet facilities, etc., and it is necessary that these subjects be given due consideration as a part of the health program.

The elimination of occupational disease hazards should be even more within the realm of the industrial physician's work. The rubber industry offers several chemical hazards, notably lead, benzol, aniline, and urotropin. It is possible to either eliminate entirely or at least to reduce the harmful effects of these chemicals to a negligible hazard. This requires knowledge of the sources of danger, proper mechanical safeguarding, frequent physical examination of individuals exposed, transferring of susceptible individuals to other occupations, and intelligent medical treatment.

VISITING NURSES

Probably one of the most direct methods of improving health standards in the home and of minimizing lost time on account of sickness and injury may be obtained through visiting of nurses and when necessary supplementing their visits by the services of a physician. Ordinarily about one-third of industrial absenteeism is due to sickness or injury, the other two-thirds to personal reasons.

PRACTICAL RESULTS

During the last twelve months, in spite of the fact that 35 per cent of our workers are women—the female absentee rate exceeds by 80 per cent that of males—our average amount of working time lost has been only 3.9 per cent. Two per cent of this was due to personal reasons, 1.7 per cent to sickness, .13 per cent to industrial accidents, and .08 per cent to non-industrial accidents.

Translated into working days lost, this means that our factory workers averaged a loss of 11.76 days from all causes, of which 6 days was due to personal reasons, 5.13 days to sickness, .39 days to industrial accidents, and .24 days to non-industrial accidents. Compared with other morbidity statistics, which indicate a loss of anywhere from seven to twelve days on account of sickness alone, our record of 5.13 days is very favorable. It would seem, too, that our industrial accident disability rate of .39 days would represent a minimum.

KEEPING A RUBBER FACTORY CLEAN

By William S. Jameson, Advisory Engineer, The Fisk Rubber Co.

CLEAN MILL ROOM PRACTICE

After an exposition on the value and need of cleanliness and ventilation in rubber factories and the organization required to effect it, the following practice was mentioned as having been applied with good results in mill-room work:

1. At the mixing mills, racks of trays are provided on which mixed rubber from the mills is placed without dusting with soapstone.

2. Most of the dust can be eliminated from stock storage rooms by spraying the stock with wet soapstone from a churn, by an atomizer.

3. All stock at the calender-warming mills is kept on platforms off the floor. When excess stock is batched out and moved from the calender, it is put on trucks, using liners between sheets, which eliminates the use of soapstone from the calender room.

4. Spilled compounds may be avoided if all batching compounds are delivered on trucks to the mills, six to eight pans per truck. These compounds are kept on the trucks until the rubber is broken down. Batch pans are set on the edge of the mill pan and minerals are shoveled onto the mills, one small scoopful at a time. Before dumping the batch pan on the mill roll it should be nearly empty. Empty pans are put back on the truck. No pans should be thrown on the floor.

5. By using the emptying pans mentioned in the above para-

graph, dust from mixing mills can be kept down to a remarkable extent.

DISPOSAL OF COLLECTED WASTE MATERIAL

Waste material collected from machines and processes are salvaged for reworking or sale, as the case may be, through a salvage department, refuse and worthless litter being incinerated.

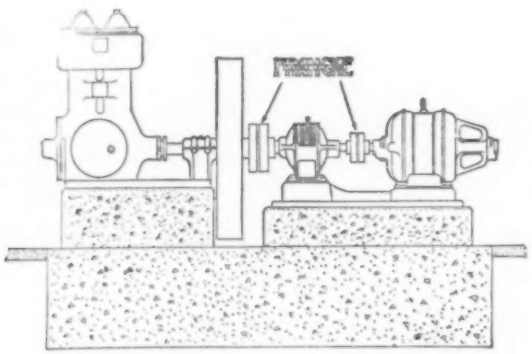
MEN FOR THE SANITARY DEPARTMENT

Experience has shown that young men are not contented with this work and men well advanced in life are not adapted to it. To build up an efficient sanitary department every endeavor should be used to secure the middle-aged men who are physically fit to remain on their feet a considerable portion of the day, doing a great amount of stair and ladder climbing, hauling cans of rubbish, etc. Such a force at work in a plant, with intelligent supervision, will maintain sanitary conditions, reduce cost of sweeping, increase plant efficiency and morale and reduce accidents.

INSTALLING DIRECT-CONNECTED MACHINERY

By John J. Serrell[1]

IT is the best practice in high speed machines to use a common bed-plate and such machines must be kept in close alinement to insure the best operating results. For moderate speeds a continuous concrete foundation is advisable where the common bed-plate might be too cumbersome or too costly.



A TYPICAL DIRECT-CONNECTED INSTALLATION

Reciprocating machinery requires heavier foundations than the rotary type but the foundation should, in any event, be heavy enough to prevent an error in the alinement of the connected machines, due to the settling of one portion of the foundation relative to another. The foundation should be long enough to take both connected machines.

Concrete usually makes the best foundation and should be cast separate from the building or other foundations which might transmit vibrations. Foundation bolts should be suspended in the usual manner from a wooden template with boxes or pipes around the tops of the bolts to allow shifting of the bolt centers to meet the variation in location of bolt holes in bed-plates, etc.

The bed-plate should be placed upon the foundation and be lined up level from the machined surfaces in both directions, using steel wedges, or double hard wood wedges, spaced about 1 foot apart. Set up the foundation bolts and check the level. Moisten the top of the foundation and grout in with a fluid mixture of 1½ parts of sand to 1 of cement by volume. If the spaces are small, 1 part of sand to 1 part of cement is better. Provide a ledge around the contour of the bed-plate so the grouting will fill in properly to a depth of from ½ to 1 inch level with the bottom of the bed-plate. Holes are frequently provided in the top of the bed-plate to facilitate grouting on the inside. Allow ample time for grout to set before running the machines.

In case no bed-plate is used, it is the best practice to level and grout in the tie plates or sole plates of bar iron or cast iron on which the connected machines will set and to which they may be doweled. If the machines are already in position on a common bed-plate the alinement should be made correct before grouting in, by supporting the bed-plate in the same position as used in the shop erection at the time when the machines were mounted on it. A bed-plate can be sprung to a very considerable extent by its own weight or that of the machine, if improperly supported.

Provision should be made in the layout of steam and hot water piping, of hot air ducts, etc., so that stress due to temperature change or weight cannot force the connected machines out of line.

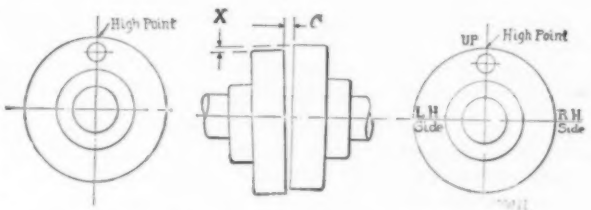
The impression prevails among many operators that flexible couplings are intended to take care of considerable error in alinement, and some even feel that no attention whatever need be given to the alinement so long as a flexible coupling is used.

The exercise of due care to obtain good initial alinement will provide greater capacity to take care of subsequent operating misalinements. Any specification of definite limits is difficult. The greater the speed, the greater the care desirable. Most turbine builders line up their machines initially within .002-inch to .004-inch. On lower speed, heavy duty, 1/100-inch is good practice, easily obtained without micrometer gages. Perhaps the best advice is to line up as carefully as possible with the tools available and check and correct the alinement if necessary. Before lining up initially and whenever convenient in checking alinement, remove the flexible pins or coupling bolts and level up.

To line up use a steel straight edge across both flanges at four positions at approximately 90-degree intervals. Shim up the lower machine all around or move one machine sidewise, or both, so that the straight edge will lay flat across both flanges at all four positions. Use a steel block and feeler, or a steel wedge, between the flanges at four similar positions. Shim up one end of one machine or move this end sidewise, or both, pivoting around the coupling until these four spacings also are the same.

FOR HIGH SPEED MACHINES

Except on very high speed turbine work where it is usual to obtain almost exact initial alinement after machines are heated up to operating temperatures, the simple method for obtaining and checking alinement, as given above, may be depended upon to give entire satisfaction.



METHOD FOR OBTAINING INITIAL ALINEMENT

To obtain the exact initial alinement and to correct for any possible eccentricity of the individual flanges, first find and mark with chalk the high points of the individual flanges by rotating them separately. Put high points together. Insert one flexible pin, or a loosely fitting through bolt, so that the flanges may be turned over together by hand. When turning them over, consistently crowd the flanges either apart or together. Take reading for both X and C between the same points on the two flanges at four positions as in the above illustration.

If C does not measure the same at all four positions, one machine should be pivoted around the coupling by shimming at one end or by sliding at that end, or both, until all four measurements are the same. If the measurements for X are not the same

[1]Smith & Serrell, Newark, New Jersey.

at all four positions then one machine should be shimmed up all around or should be moved sidewise, or both, until these four measurements also are the same.

ALTERNATE METHODS

In special cases or if the flanges are of a dissimilar diameter, use a C-clamp and offset arm with a pointed set-screw. With a feeler obtain the measurements for X as shown between the point of the set-screw and the periphery of the flange. Scribe a line on this flange and obtain the measurements from the point of the set-screw to this line as for C above. In both cases revolve the flanges together, crowd them apart or together, and correct for the misalinement in the manner described on the preceding page.

A turned or ground bar for a sliding fit in the pin-holes will serve instead of a straight edge across the flanges. This will also test for concentricity of the pin-circle diameter with respect to the bores or flanges.

DOWEL MACHINE IN PLACE

After all readings for both C and X have been finally checked as correct, set up the bolts and dowel the machines in place. If a machine is to be redoweled after correcting for misalinement, do not use the same dowels and holes, but drill and ream new holes, or ream out the old holes and use larger dowels.

Silent Chain Drives in Rubber Mills

CHAIN drives are accepted by engineers as standard transmission for service in connection with electric motors up to 1,000 horsepower and are rapidly superseding belt drives and gearing in most fields.

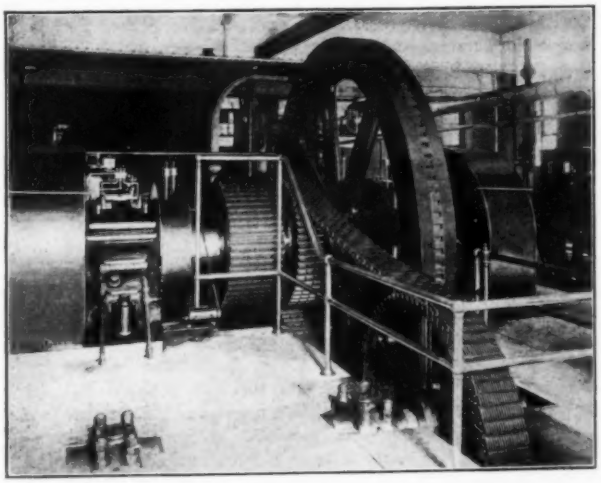
ADVANTAGES OF CHAIN DRIVES

They are particularly advantageous in rubber work where sudden changes of working load are so marked an operating feature, particularly on breaking down and mixing mills.

"The great advantages of the chain drive[1] are the positiveness of drive, which characterizes gearing, and the possibility of running at high speeds without the disagreeable noises attending gear drives, or drives using the ordinary sprocket chain when operating at high speeds. Chains do not require the sprockets to be set at fixed centers, they run with smooth action and are not affected by wear or stretching. Excessive journal friction is avoided as the chain is always run slack."

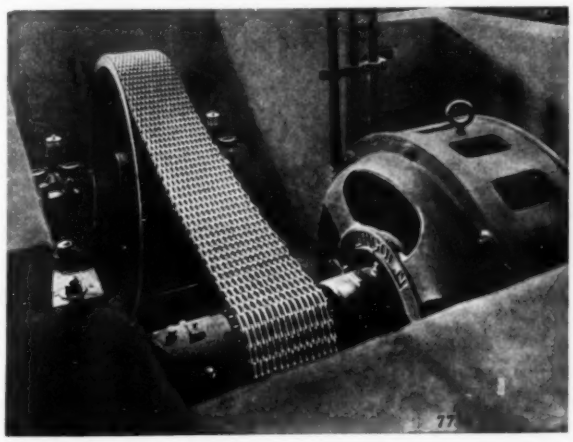
MEETS RUBBER MILL REQUIREMENTS

There are many applications of silent chain drives in American rubber mills where gearing has heretofore been used almost exclusively. Repair and maintenance costs due to the gears transmitting shocks and jars have in many cases caused the substitution of chain drives for gearing. The service required, especially when washing or mixing new gum, is very severe, the load often varying from 25 to 150 per cent of normal within a few seconds. Under such conditions chains have been operated 20 hours a day for three years without requiring repairs of any kind. In view of such a record it is of interest to note some of the principal applications of silent chain drives in rubber mills shown in the accompanying illustrations, which are actual examples in American engineering practice.



Morse Chain Co.

1,000 HORSE-POWER LINE SHAFT DRIVE



Link Belt Co.

200 HORSE-POWER MIXING MILL DRIVE

TYPICAL INSTALLATIONS

A 1,000 and a 500 horse-power chain drive are used to operate line shafts in rubber mills. The chains are three inches pitch, 24 inches wide, and 12 inches wide, respectively.

Mill lines are operated by 200 horse-power drives.

Three-roll calenders are driven by 50 horse-power chains, 6 inches wide, 1.2 inches pitch, at a speed of 1,450 feet a minute. The load carried on calenders is more even than on mills or mixers, yet chain drives have shown a great improvement over gearing owing to the frequent stoppings, changes from one speed to another, etc., the shocks and jars being absorbed by the chains and not transmitted to the motors.

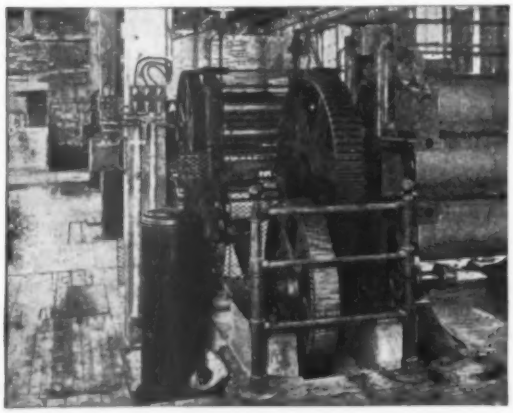
DESIGN AND OPERATION OF SILENT CHAINS

In one well-known drive the engagement of the chain with the wheel is dependent on two forces definitely operative to keep the chain in its proper pitch contact with the wheels by causing it to assume a larger and larger circle as the chain lengthens in pitch; thus, the driving load continues to be distributed over a large number of teeth.

By referring to the illustration it will be noticed that the link contact with the teeth is resisted at *R* which is below the line

[1] The American Engineer, May, 1903.

of tension *T-T*, while the resultant force *F*, due to the lever action, tends to maintain the chain link at its true pitch diameter while in contact with the wheel. The angle of the tooth to the line of the pull, and any centrifugal force that may exist, tends to keep the link out to its true pitch diameter during the revolution of the wheel; it will fall below this point only when the pull of the slack side of the chain is greater than the forces in the opposite direction. This climbing, which compensates for the increase of pitch, is gradual, easily noticed in the running drive, does not decrease the efficiency of the transmission, and as the chain lengthens and approaches the top of the teeth, gives fair warning of the necessity of replacement or repair of the chain; thus the delay incident to an unexpected repair is avoided.

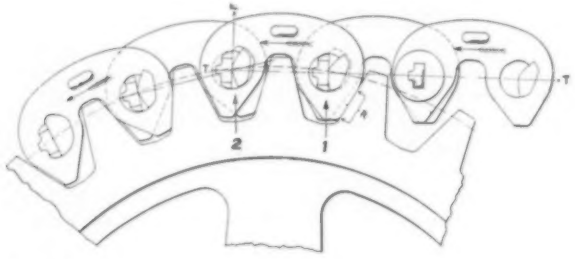


Morse Chain Co.

50 HORSE-POWER THREE-ROLL CALENDER DRIVE

It will also be noticed that the chain joint is composed of two pieces, each piece securely anchored, having no movement in its respective end of the link, and so shaped as to provide a roller bearing connecting each set of link plates. The rolling action is shown by the two positions of the joint pins at 1 and 2.

In assembling the chain the link plates are interspersed with lapping ends in relation to each other, and in any width desired for the power to be transmitted. The apertures are so shaped as to provide clearance for the joint pin, which is a part of the opposite leading link, and permit a free rolling action of one joint member on the other when the chain is mounting and leaving the sprocket wheels.

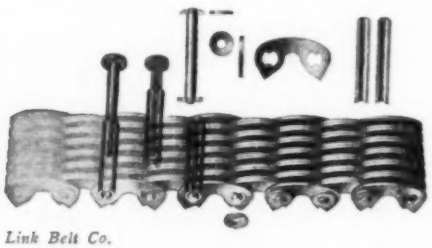


Morse Chain Co.

DIAGRAM OF JOINT ACTION

Another popular type attributes its success to the superiority of its joint construction. The segmental liners of bushings, which are removable, extend across the entire width of the chain, thus doubling the bearing surface and halving the bearing pressure on the joint. The bushings are case hardened, and bear upon the case hardened pin. The latter is free to, and does rotate with reference to the bushings and presents every particle of its surface for wear. As a result it wears uniformly, keeps round, and the chain maintains to the end its high initial efficiency.

The important point about this patented bush-joint construction is that it limits natural wear to the case hardened pin and the inside surface of the case hardened bushings—which means long life and continued quiet operation. Without bushings the wear is more rapid because the chain links are not protected by sleeves—the pins come in direct contact with the links; the holes, therefore, enlarge, destroying the original accurate pitch of the chain.



Link Belt Co.

BUSHED JOINT CHAIN

CALENDAR

THE UNITED STATES

Nov. 14-19, Jersey City, N. J., Second Annual Automobile Show of Hudson County Automobile Trade Association. Fourth Regiment Armory.

Nov. 15-16, New York. Convention of Factory Service Managers. National Automobile Chamber of Commerce, 366 Madison avenue at 46th street, New York, N. Y. Secretary, A. J. Brosseau.

Nov. 18, Dec. 23, Feb. 24, March 24. April. 28, May 26. Society of Automotive Engineers, Detroit, Michigan.

Nov. 27-Dec. 3, New York, N. Y. Automobile Salon, Hotel Commodore.

FOREIGN SHOWS

Nov. 4-12, London, England. British Motor Show, Society Motor Manufacturers and Traders.

Nov. 7-14, Paris, France. Seventh International Exposition of Aerial Locomotion. Grand Palais of Champs Elysées. Held by Chambre Syndicale des Industries Aeronautiques.

Nov. 26-Dec. 3, Shanghai, China. Automobile Show.

SOCIETY OF AUTOMOTIVE ENGINEERS FORMS RESEARCH DEPARTMENT

The Society of Automotive Engineers, in its recent establishment of a research department, aims to furnish an organization which will be of value to the automotive industry, and also to the country in general. The new department is to assist in the development of a more systematic program of research throughout the industry, two general problems, for instance, calling for immediate consideration. These are the fuel problem and the highway problem. The latter question may be within the province of the road engineer, but the automotive engineer will be very much interested in both the answer and the method of determining it. Dr. H. C. Dickinson is the newly appointed manager of the S. A. E. research department.

PONTIANAK RESIN

A good grade of pontianak resin has lately appeared in the New York market. It comes in slabs from one to two inches in thickness. This material is an entirely pure, clean, filtered product, fairly dark in color, and marks the first appearance of pontianak resin since the war.

Vulcanization Tests on Hexamethylene Tetramine, Formaldehyde Aniline and Aldehyde Ammonia[1]

By C. S. Williams

THE following series of tests were undertaken to give rubber manufacturers more complete practical information regarding the use of hexamethylene tetramine, formaldehyde aniline and aldehyde ammonia than has hitherto been published. The following five type formulas were selected, to which were added varying quantities of accelerators:

1. 100 pure gum, 5 sulphur.
2. 100 pure gum, 2 heavy calcined magnesia, 5 sulphur.
3. 100 pure gum, 100 zinc oxide, 7 sulphur.
4. 100 pure gum, 100 zinc oxide, 2 heavy calcined magnesia, 7 sulphur.
5. 100 pure gum, 3 zinc oxide, 5 sulphur.

It will be seen that the above formulas are designed to show, respectively: (1) The effect of the use of the three above accelerators in pure gum in the absence of any inorganic material aside from sulphur; (2) The effect of small quantities of heavy calcined magnesia upon their accelerating action; (3) The effect of large quantities of zinc; (4) The effect of large quantities of zinc with small quantities of heavy calcined magnesia; (5) The effect of small quantities of zinc.

The first four series are complete for the three accelerators named but for the last series only the results of tests with hexamethylene tetramine are shown, since complete information for the other two accelerators has not yet been accumulated.

In making these tests, every precaution was taken to have the results absolutely comparable. A single lot of rubber was selected for each series. Every batch mixed was of uniform volume, was milled by one operator in exactly the same manner and at the same temperature.

The samples were cured in a steam press in slabs six inches by six inches by ⅛-inch thick. After standing at least 18 hours, these slabs were cut into test pieces with a die giving a test section ⅛-inch wide. Five such pieces from each sample were tested in a Scott rubber testing machine, running 20 inches per minute. The results from each set of five tests were averaged and recorded.

The tensile is recorded in pounds per square inch. The elongation is given in percentage. The set was measured two minutes after the break.

The length of cures was selected to give a gradation from decided undercure through the optimum cure to decided overcure. Lack of space does not permit the publication of all the figures so obtained. Those figures only are shown leading up to the maximum tensile or just passing that point.

The data for each series of tests are presented in tabular form below, showing the results obtained from the use of variable amounts of accelerators in each of the typical formulas indicated.

[1]Tests made in the laboratory of the Perth-Amboy Chemical Works, Perth Amboy, New Jersey.

CONCLUSIONS

Table I. All three accelerators are active in pure gum stocks containing no inorganic material except sulphur. Hexamethylene tetramine produces its maximum cure in four hours and 30 minutes at 287 degrees F., when one per cent is used. Under these conditions a tensile of 3,411 pounds per square inch is obtained with an elongation of 1,040 per cent and a set of 18 per cent.

By using formaldehyde aniline the maximum tensile is produced in three hours at 298 degrees F., using one per cent. However, this tensile is practically the same as that produced by the same quantity of hexa used under the same conditions, but less set and elongation are noticeable with the formaldehyde aniline.

The behavior of aldehyde ammonia in pure gum stock is quite striking. From the table it will be seen that practically all the tensiles recorded are above 2,600, and that most of those recorded for 0.5 and 0.75 per cent are over 3,000. The maximum tensile, 3,870, was produced by curing the stock containing 0.75 per cent, 45 minutes at 298 degrees F.

Table II. The presence of a small amount of heavy calcined magnesia aids the action of hexamethylene tetramine to a slight degree. The best effect appears to be produced by the addition of one per cent hexa and curing two hours at 298 degrees F. The action of both aldehyde ammonia and formaldehyde aniline is retarded by the presence of a small quantity of heavy calcined magnesia.

Table III. In the presence of large quantities of zinc, hexamethylene tetramine is rendered very active. Good cures are produced in very short periods and at moderate temperatures. Formaldehyde aniline is slightly less active and aldehyde ammonia is still less active but produces satisfactory stocks when one per cent is used.

Table IV. The addition of two per cent heavy calcined magnesia to a stock heavily compounded with zinc produces quite surprising results. For example, the addition of magnesia caused the tensile of the sample cured with one per cent of hexamethylene tetramine for 45 minutes at 298 degrees F., to rise from 2,559 to 3,743. Similar results were obtained from formaldehyde aniline and aldehyde ammonia stock, particularly when a larger per cent of the accelerator was used.

Table V. This table shows the decided effect that the presence of a small quantity of zinc oxide has upon the accelerating property of hexamethylene tetramine.

In addition to the fact that the time of vulcanization is greatly shortened, very much higher tensiles are obtained. Another noticeable feature is the uniformity of high tensile that is produced at temperatures of 287, 298 and 307 degrees F., which permits the adoption of hexamethylene tetramine to cures of widely varying temperature.

TABLE I

FORMULA—100 CRUDE RUBBER, 5 SULPHUR

CONTROL—NO ACCELERATOR

Temperature	287° F.				298° F.				307° F.			
Time, minutes	210	240	270	300	180	210	240	270	150	180	210	240
Elongation	1,012	1,070	1,050	1,020	1,110	1,080	1,030	1,030	1,015	1,000	1,030	1,000
Set, per cent	16	15	18	16	19	18	19	14	18	19	15	14
Tensile	1,656	2,257	2,355	2,450	2,349	2,371	2,188	1,677	2,417	2,517	2,526	2,008

0.5% HEXAMETHYLENE TETRAMINE

Temperature	287° F.				298° F.				307° F.			
Time, minutes	180	210	240	270	150	180	210	...	120	150	180	210
Elongation	1,075	1,060	1,050	1,035	1,055	1,060	1,050	...	1,020	1,040	1,044	1,080
Set, per cent	19	19	18	18	14	18	18	...	21	17	18	19
Tensile	2,287	2,593	2,893	2,873	2,437	3,018	2,863	...	2,307	2,512	2,485	2,330

0.75% HEXAMETHYLENE TETRAMINE

Temperature	287° F.				298° F.				307° F.			
Time, minutes	180	210	240	270	150	180	210	...	120	150	180	210
Elongation	1,060	1,060	1,060	1,040	1,030	1,050	1,010	...	1,050	1,100	1,090	1,075
Set, per cent	18	18	19	18	20	18	19	...	21	16	19	20
Tensile	2,199	2,720	2,687	2,964	2,749	3,023	2,659	...	2,018	2,504	2,820	2,365

1.0% HEXAMETHYLENE TETRAMINE

Temperature	287° F.				298° F.				307° F.			
Time, minutes	180	210	240	270	150	180	210	...	120	150	180	...
Elongation	1,045	1,030	1,080	1,040	1,140	1,150	1,115	...	1,100	1,166	1,100	...
Set, per cent	17	17	18	18	17	19	18	...	20	19	20	...
Tensile	2,439	2,708	2,868	3,411	2,503	3,171	2,374	...	2,265	2,715	2,119	...

1.5% HEXAMETHYLENE TETRAMINE

Temperature	287° F.				298° F.				307° F.			
Time, minutes	180	210	240	270	150	180	210	...	120	150	180	210
Elongation	1,090	1,130	1,110	1,100	1,120	1,160	1,150	...	1,200	1,240	1,260	1,270
Set, per cent	14	14	14	16	18	19	14	...	19	20	18	21
Tensile	2,242	2,411	2,892	3,015	2,121	2,439	2,170	...	2,124	2,387	2,078	1,938

1.0% FORMALDEHYDE ANILINE

Temperature	287° F.				298° F.				307° F.			
Time, minutes	210	240	270	300	150	180	210	...	60	90	120	150
Elongation	1,060	1,020	1,040	1,050	1,020	1,040	1,040	...	1,010	1,075	1,010	1,060
Set, per cent	16	16	18	16	16	17	18	...	18	14	16	16
Tensile	2,117	2,632	2,821	2,695	2,518	3,168	2,743	...	1,312	2,263	2,301	2,288

2.0% FORMALDEHYDE ANILINE

Temperature	287° F.				298° F.				307° F.			
Time, minutes	210	240	270	300	150	180	210	...	60	120	150	180
Elongation	1,010	1,030	1,060	1,070	1,060	1,050	1,050	...	1,060	1,090	1,100	1,100
Set, per cent	13	12	13	15	16	14	15	...	17	18	16	17
Tensile	2,141	2,700	2,963	2,889	2,569	2,898	2,576	...	1,489	2,117	2,200	2,071

3.0% FORMALDEHYDE ANILINE

Temperature	287° F.				298° F.				307° F.			
Time, minutes	180	210	240	270	150	180	210	...	60	90	120	150
Elongation	1,070	1,070	1,070	1,100	1,090	1,090	1,130	...	1,020	1,100	1,106	1,200
Set, per cent	16	16	16	15	16	19	17	...	15	12	18	16
Tensile	2,380	2,111	2,693	2,627	2,312	2,437	2,469	...	1,795	2,348	2,242	2,182

0.5% ALDEHYDE AMMONIA

Temperature	287° F.				298° F.				307° F.			
Time, minutes	90	120	150	180	90	120	150	180	20	30	60	90
Elongation	950	930	950	960	950	970	990	1,020	910	790	940	970
Set, per cent	12	12	11	12	11	12	13	12	11	16	11	11
Tensile	2,821	3,726	3,644	3,410	2,977	3,286	3,294	3,044	2,682	3,287	3,657	3,247

0.75% ALDEHYDE AMMONIA

Temperature	287° F.				298° F.				307° F.			
Time, minutes	150	180	210	...	30	45	60	90	90	105	120	150
Elongation	950	970	960	...	930	910	940	970	930	1,030	1,060	1,050
Set, per cent	13	13	11	...	10	10	12	11	11	12	15	16
Tensile	2,978	3,091	2,559	...	2,632	3,870	3,800	3,354	2,612	2,992	2,871	2,533

1.0% ALDEHYDE AMMONIA

Temperature	287° F.				298° F.				307° F.			
Time, minutes	150	180	210	...	150	180	210	240	60	90	105	120
Elongation	980	1,060	1,000	...	1,000	1,030	1,070	1,040	1,009	1,020	1,040	1,100
Set, per cent	12	14	12	...	13	14	14	12	12	13	13	13
Tensile	2,830	3,263	2,852	...	2,622	2,933	2,942	2,460	2,860	2,875	2,878	2,798

2.0% ALDEHYDE AMMONIA

Temperature	287° F.				298° F.				307° F.			
Time, minutes	150	180	210	...	120	150	180	210	120	135	150	180
Elongation	960	1,060	990	...	1,040	1,020	1,095	1,170	1,140	1,030	1,150	1,060
Set, per cent	10	13	11	...	13	13	15	15	17	15	17	15
Tensile	1,981	2,594	2,067	...	2,295	2,231	2,420	2,369	2,188	1,908	2,383	1,744

TABLE II

FORMULA—100 CRUDE RUBBER, 2 HEAVY CALCINED MAGNESIA, 5 SULPHUR

CONTROL—NO ACCELERATOR

Temperature	287° F.				298° F				307° F.			
Time, minutes	180	240	300	360	120	150	180	240	90	120	150	180
Elongation	890	840	840	830	870	870	830	810	880	850	830	820
Set, per cent	22	17	17	19	18	17	19	19	19	17	19	19
Tensile	1,577	2,010	2,094	2,595	2,142	2,112	2,655	2,655	2,466	2,735	3,025	2,705

0.5% HEXAMETHYLENE TETRAMINE

Temperature	287° F.				298° F.				307° F.			
Time, minutes	180	210	300	360	60	90	120	150	60	90	120	150
Elongation	860	860	850	830	820	860	860	850	880	910	850	860
Set, per cent	15	17	19	17	15	15	15	16	15	15	16	17
Tensile	2,155	2,445	3,082	2,901	2,423	2,619	3,110	2,826	2,525	3,003	3,026	3,006

0.75% HEXAMETHYLENE TETRAMINE

Temperature	287° F.				298° F.				307° F.			
Time, minutes	180	210	300	360	60	90	120	150	60	90	120	150
Elongation	810	870	850	830	860	840	850	820	840	830	870	870
Set, per cent	14	18	18	17	14	15	15	16	15	15	17	16
Tensile	2,198	3,001	3,342	2,821	2,624	2,889	2,882	2,714	2,887	2,926	3,309	3,199

1.0% HEXAMETHYLENE TETRAMINE

Temperature	287° F.				298° F.				307° F.			
Time, minutes	180	210	240	300	60	90	120	150	45	60	90	120
Elongation	820	860	880	850	830	840	870	840	840	860	840	860
Set, per cent	15	17	19	19	17	16	20	17	16	18	16	17
Tensile	2,903	3,473	3,079	3,514	2,702	2,954	3,816	3,457	2,819	3,176	3,265	3,229

1.5% HEXAMETHYLENE TETRAMINE

Temperature	287° F.				298° F.				307° F.			
Time, minutes	180	210	300	360	60	90	120	150	60	90	120	150
Elongation	830	840	850	840	810	820	820	840	840	830	880	910
Set, per cent	18	15	17	17	15	17	16	18	19	17	16	16
Tensile	3,297	3,529	3,572	3,357	3,059	3,084	3,177	3,023	3,227	3,234	3,411	3,061

0.75% FORMALDEHYDE ANILINE

Temperature	287° F.				298° F.				307° F.			
Time, minutes	150	180	240	300	90	150	180	210	45	60	90	120
Elongation	950	930	910	890	910	890	910	900	890	890	870	900
Set, per cent	22	20	17	17	21	18	18	17	20	19	19	18
Tensile	1,419	1,659	1,985	2,030	1,662	2,145	2,261	2,161	1,452	1,878	2,404	2,319

1.0% FORMALDEHYDE ANILINE

Temperature	287° F.				298° F.				307° F.			
Time, minutes	150	180	240	300	90	150	180	210	45	60	90	120
Elongation	970	940	930	900	900	910	890	900	890	930	880	900
Set, per cent	22	20	18	19	20	19	19	17	24	19	20	19
Tensile	1,753	1,942	2,256	2,221	1,581	2,137	2,461	2,189	1,238	2,097	2,349	2,347

2.0% FORMALDEHYDE ANILINE

Temperature	287° F.				298° F.				307° F.			
Time, minutes	150	180	240	300	90	150	180	210	45	60	90	120
Elongation	950	900	960	930	920	910	940	940	870	910	900	960
Set, per cent	19	17	19	17	18	19	19	17	21	20	19	19
Tensile	1,780	2,164	2,356	2,285	1,795	2,331	2,429	2,269	1,649	2,123	2,336	2,300

3.0% FORMALDEHYDE ANILINE

Temperature	287° F.				298° F.				307° F.			
Time, minutes	150	180	240	300	90	150	180	210	45	60	90	120
Elongation	920	890	970	980	870	880	990	990	890	860	860	1,020
Set, per cent	17	14	18	18	18	18	19	19	16	16	18	19
Tensile	2,111	2,256	2,435	1,927	2,001	2,154	2,351	2,005	2,173	2,217	2,457	2,226

0.5% ALDEHYDE AMMONIA

Temperature	287° F.				298° F				307° F.			
Time, minutes	150	180	210	...	120	150	180	...	30	45	60	...
Elongation	870	860	880	...	850	900	900	...	870	850	840	...
Set, per cent	18	20	24	...	18	20	19	...	17	20	19	...
Tensile	3,320	3,446	3,422	...	3,042	3,348	3,108	...	2,460	3,200	2,865	...

0.75% ALDEHYDE AMMONIA

Temperature	287° F.				298° F				307° F.			
Time, minutes	180	210	240	...	60	90	120	150	30	45	60	...
Elongation	850	880	900	...	870	880	870	900	830	860	8[illegible]0	...
Set, per cent	19	19	16	...	16	18	18	17	16	22	21	...
Tensile	3,360	3,457	3,161	...	2,674	3,552	3,311	3,186	2,983	3,317	3,271	...

1.0% ALDEHYDE AMMONIA

Temperature	287° F.				298° F.				307° F.			
Time, minutes	150	180	210	...	90	120	150	...	30	45	60	...
Elongation	870	860	860	...	890	870	890	...	860	840	840	...
Set, per cent	17	17	17	...	17	18	17	...	17	18	17	...
Tensile	3,095	3,217	3,047	...	2,887	3,017	2,938	...	3,242	3,507	3,041	...

1.5% ALDEHYDE AMMONIA

Temperature	287° F.				298° F.				307° F.			
Time, minutes	180	210	240	...	120	150	180	...	30	45	60	...
Elongation	880	900	890	...	910	920	950	...	850	890	880	...
Set, per cent	16	17	13	...	15	13	14	...	18	16	16	...
Tensile	2,980	3,089	2,741	...	2,908	3,087	2,975	...	3,137	3,141	3,070	...

TABLE III

FORMULA—100 CRUDE RUBBER, 100 ZINC OXIDE, 7 SULPHUR

CONTROL—NO ACCELERATOR

Temperature	287° F.				298° F.				307° F.			
Time, minutes	120	150	180	210	60	90	150	180	60	90	120	150
Elongation	680	550	500	500	500	500	540	530	480	500	540	470
Set, per cent	27	27	27	25	29	26	35	35	24	28	37	28
Tensile	1,169	1,233	1,259	1,236	1,168	1,326	1,741	1,657	1,419	1,614	1,733	1,251

0.5% HEXAMETHYLENE TETRAMINE

Temperature	287° F				298° F.				307° F.			
Time, minutes	45	60	90	120	45	60	90	120	45	60	90	...
Elongation	510	550	490	480	520	500	490	470	480	500	330	...
Set, per cent	29	32	26	27	29	27	37	37	30	35	21	...
Tensile	1,431	1,963	2,119	2,072	2,215	2,269	2,673	2,261	2,445	2,844	1,607	...

0.75% HEXAMETHYLENE TETRAMINE

Temperature	287° F.				298° F.				307° F.			
Time, minutes	45	90	150	180	45	60	90	120	45	60	90	...
Elongation	540	520	460	460	510	520	480	410	480	470	300	...
Set, per cent	33	31	33	37	29	32	36	30	31	35	21	...
Tensile	1,999	2,319	2,598	2,915	2,220	2,445	2,668	2,257	2,596	2,711	1,471	...

1.0% HEXAMETHYLENE TETRAMINE

Temperature	287° F.				298° F.				307° F.			
Time, minutes	60	90	120	150	30	45	60	90	30	45	60	90
Elongation	520	480	470	340	540	500	500	420	520	490	480	240
Set, per cent	27	31	34	24	27	34	33	35	27	36	38	18
Tensile	2,155	2,683	2,809	1,999	1,696	2,559	2,491	2,332	1,914	2,735	2,647	1,281

1.5% HEXAMETHYLENE TETRAMINE

Temperature	287° F.				298° F.				307° F.			
Time, minutes	60	90	120	150	30	45	60	90	20	30	45	60
Elongation	480	420	410	300	500	450	440	270	510	520	420	380
Set, per cent	25	28	37	20	26	30	31	19	29	32	30	29
Tensile	2,091	2,252	2,827	1,696	2,166	2,654	2,550	1,468	2,452	2,687	2,533	2,295

0.5% FORMALDEHYDE ANILINE

Temperature	287° F.				298° F.				307° F.			
Time, minutes	60	90	150	180	45	60	90	...	45	60	90	...
Elongation	530	510	540	520	510	560	490	...	510	480	460	...
Set, per cent	32	28	30	31	27	30	29	...	29	31	32	...
Tensile	1,478	1,827	2,302	2,152	1,385	2,088	1,989	...	1,961	2,265	1,877	...

0.75% FORMALDEHYDE ANILINE

Temperature	287° F.				298° F.				307° F.			
Time, minutes	60	90	150	180	45	60	90	...	45	60	90	...
Elongation	500	510	520	510	540	520	460	...	500	500	430	...
Set, per cent	26	26	32	31	30	28	28	...	29	35	32	...
Tensile	1,567	1,927	2,489	2,185	1,614	2,094	2,048	...	2,220	2,605	1,914	...

1.0% FORMALDEHYDE ANILINE

Temperature	287° F.				298° F.				307° F.			
Time, minutes	60	90	150	180	60	90	120	...	30	45	60	90
Elongation	530	510	480	460	500	490	480	...	500	530	460	390
Set, per cent	30	28	31	33	23	34	33	...	27	32	33	29
Tensile	1,812	2,002	2,554	2,401	1,805	2,350	2,304	...	1,947	2,609	2,359	1,881

1.5% FORMALDEHYDE ANILINE

Temperature	287° F.				298° F.				307° F.			
Time, minutes	60	90	150	180	60	90	120	150	30	45	60	90
Elongation	540	480	480	430	510	440	450	330	510	490	430	350
Set, per cent	28	28	34	29	29	33	36	20	27	35	31	25
Tensile	2,005	2,225	2,758	2,201	2,286	2,306	2,387	1,802	2,206	2,783	2,513	1,755

2.0% FORMALDEHYDE ANILINE

Temperature	287° F.				298° F.				307° F.			
Time, minutes	60	120	150	...	60	90	120	...	30	45	60	...
Elongation	520	480	440	...	490	440	340	...	500	470	440	...
Set, per cent	25	30	30	...	29	33	25	...	25	31	29	...
Tensile	1,891	2,243	2,189	...	2,314	2,547	1,630	...	2,154	2,477	2,186	...

3.0% FORMALDEHYDE ANILINE

Temperature	287° F.				298° F.				307° F.			
Time, minutes	60	120	150	...	30	60	90	120	20	30	45	60
Elongation	490	450	410	...	540	490	380	160	510	500	440	410
Set, per cent	23	34	32	...	25	30	28	18	33	29	34	31
Tensile	1,859	2,488	2,226	...	1,871	2,364	2,186	828	811	2,442	2,420	2,115

0.5% ALDEHYDE AMMONIA

Temperature	287° F.				298° F.				307° F.			
Time, minutes	120	150	180	210	60	90	120	150	45	60	90	...
Elongation	530	530	560	530	550	510	540	500	540	510	490	...
Set, per cent	30	31	36	37	28	29	35	34	25	27	27	...
Tensile	2,279	2,403	2,435	2,368	1,928	2,026	2,306	2,161	1,552	1,919	1,734	...

1.0% ALDEHYDE AMMONIA

Temperature	287° F.				298° F.				307° F.			
Time, minutes	90	120	150	...	45	60	90	...	45	60	90	...
Elongation	500	490	500	...	550	530	500	...	520	500	410	...
Set, per cent	26	31	33	...	31	30	30	...	27	30	21	...
Tensile	2,133	2,507	2,416	...	2,125	2,658	2,519	...	1,939	2,255	1,614	...

1.5% ALDEHYDE AMMONIA

Temperature	287° F.				298° F.				307° F.			
Time, minutes	60	90	120	150	45	60	90	...	45	60	90	...
Elongation	500	500	480	480	510	530	470	...	500	460	330	...
Set, per cent	30	29	27	29	30	32	30	...	32	30	16	...
Tensile	1,712	2,356	2,349	2,314	2,249	2,874	2,288	...	2,077	2,239	1,321	...

TABLE IV

FORMULA—100 CRUDE RUBBER, 100 ZINC OXIDE, 2 HEAVY CALCINED MAGNESIA, 7 SULPHUR

CONTROL—NO ACCELERATOR

Temperature	287° F.				298° F.				307° F.			
Time, minutes	120	150	180	...	90	120	150	...	60	90	120	...
Elongation	640	680	660	...	690	690	650	...	690	670	670	...
Set, per cent	25	25	24	...	24	26	27	...	25	31	34	...
Tensile	1,694	2,208	2,184	...	2,091	2,599	2,575	...	2,374	2,946	2,674	...

0.5% HEXAMETHYLENE TETRAMINE

Temperature	287° F.				298° F.				307° F.			
Time, minutes	60	90	120	150	45	60	90	...	30	45	60	90
Elongation	650	650	650	680	620	610	590	...	620	630	600	520
Set, per cent	23	27	27	30	25	28	34	...	30	33	35	29
Tensile	2,395	3,021	3,356	2,974	2,821	3,483	3,453	...	3,144	3,485	3,379	2,608

0.75% HEXAMETHYLENE TETRAMINE

Temperature	287° F.				298° F.				307° F.			
Time, minutes	60	90	120	...	45	60	90	...	30	45	60	90
Elongation	630	630	610	...	620	580	550	...	580	590	540	440
Set, per cent	23	33	34	...	30	31	36	...	31	34	34	25
Tensile	2,962	3,306	3,194	...	3,344	3,569	3,453	...	3,345	3,354	3,210	2,281

1.0% HEXAMETHYLENE TETRAMINE

Temperature	287° F.				298° F.				307° F.			
Time, minutes	60	90	120	150	30	45	90	120	20	30	45	60
Elongation	630	560	590	540	660	620	580	530	630	570	590	480
Set, per cent	25	28	35	34	23	31	32	33	25	34	36	29
Tensile	3,357	3,005	3,453	3,099	3,136	3,743	3,608	3,467	3,425	3,625	3,500	2,857

1.5% HEXAMETHYLENE TETRAMINE

Temperature	287° F.				298° F.				307° F.			
Time, minutes	60	90	120	...	45	60	90	...	15	20	30	45
Elongation	590	560	500	...	580	550	440	...	630	600	530	540
Set, per cent	28	34	33	...	34	34	27	...	23	32	35	35
Tensile	3,296	3,374	3,016	...	3,621	3,659	2,870	...	1,736	3,598	3,379	3,246

0.75% FORMALDEHYDE ANILINE

Temperature	287° F.				298° F.				307° F.			
Time, minutes	120	150	180	210	45	60	90	120	30	45	60	...
Elongation	670	600	630	640	660	650	630	640	640	660	620	...
Set, per cent	24	25	26	31	35	27	29	32	23	27	30	...
Tensile	2,373	2,625	2,793	2,738	2,402	2,885	2,961	2,863	2,393	2,930	2,811	...

1.0% FORMALDEHYDE ANILINE

Temperature	287° F.				298° F.				307° F.			
Time, minutes	90	120	150	180	45	60	90	...	20	30	45	60
Elongation	650	650	600	600	650	630	600	...	760	640	610	570
Set, per cent	24	27	27	28	26	30	32	...	25	27	29	33
Tensile	2,795	2,901	3,160	2,889	2,757	3,198	3,133	...	2,245	2,948	2,904	2,839

1.5% FORMALDEHYDE ANILINE

Temperature	287° F.				298° F.				307° F.			
Time, minutes	90	120	150	180	45	60	90	120	30	45	60	...
Elongation	650	630	590	590	640	610	580	600	640	610	570	...
Set, per cent	25	27	30	29	24	28	32	35	27	30	33	...
Tensile	3,133	3,148	3,247	3,015	2,756	3,218	3,260	3,024	3,096	3,448	2,944	...

2.0% FORMALDEHYDE ANILINE

Temperature	287° F.				298° F.				307° F.			
Time, minutes	90	120	150	180	45	60	90	...	20	30	45	60
Elongation	640	630	580	550	620	580	530	...	750	640	620	540
Set, per cent	27	30	33	33	24	33	33	...	28	29	30	34
Tensile	3,163	3,290	3,430	2,947	3,138	3,349	3,128	...	1,893	3,434	3,432	3,047

0.5% ALDEHYDE AMMONIA

Temperature	287° F.				298° F.				307° F.			
Time, minutes	90	120	150	...	60	90	120	150	30	45	60	90
Elongation	660	640	610	...	650	650	650	640	660	660	670	640
Set, per cent	24	25	24	...	25	26	30	32	22	25	28	32
Tensile	1,780	2,329	2,226	...	2,249	2,287	2,479	2,364	1,814	2,249	2,357	2,203

0.75% ALDEHYDE AMMONIA

Temperature	287° F.				298° F.				307° F.			
Time, minutes	90	120	150	...	60	90	120	150	30	45	60	90
Elongation	660	630	600	...	640	630	620	610	630	620	640	600
Set, per cent	26	26	25	...	27	31	34	33	22	25	30	34
Tensile	2,420	2,666	2,611	...	2,514	2,501	2,576	2,538	2,324	2,469	2,637	2,063

1.0% ALDEHYDE AMMONIA

Temperature	287° F.				298° F.				307° F.			
Time, minutes	90	120	150	...	60	90	120	...	30	45	60	90
Elongation	630	620	580	...	610	520	500	...	650	650	630	540
Set, per cent	25	26	25	...	32	34	33	...	24	28	30	35
Tensile	2,653	2,774	2,508	...	2,584	2,895	2,668	...	2,431	2,630	2,633	1,887

1.5% ALDEHYDE AMMONIA

Temperature	287° F.				298° F.				307° F.			
Time, minutes	45	60	90	120	60	90	120	...	30	45	60	90
Elongation	630	590	620	580	600	600	570	...	610	600	600	460
Set, per cent	25	29	29	28	30	36	32	...	29	32	35	21
Tensile	2,305	2,979	2,900	2,795	2,773	3,007	2,605	...	2,737	2,934	2,979	1,559

TABLE V

FORMULA—100 RUBBER, 3 ZINC OXIDE, 5 SULPHUR

CONTROL—NO ACCELERATOR

Temperature	287° F.				298° F.				307° F.			
Time, minutes	180	210	240	270	150	180	210	...	90	120	150	180
Elongation	790	820	810	800	860	870	810	...	840	810	840	850
Set, per cent	15	13	14	15	16	16	16	...	15	17	17	15
Tensile	1,512	2,011	2,222	2,453	2,387	2,614	2,154	...	2,311	2,694	2,107	1,829

0.5% HEXAMETHYLENE TETRAMINE

Temperature	287° F.				298° F.				307° F.			
Time, minutes	60	90	120	150	45	60	90	...	30	40	45	60
Elongation	730	690	700	650	730	730	680	...	720	670	690	660
Set, per cent	10	17	22	20	14	21	24	...	14	17	17	22
Tensile	2,217	3,321	3,847	2,879	3,063	3,526	3,340	...	3,173	3,687	3,401	3,352

0.75% HEXAMETHYLENE TETRAMINE

Temperature	287° F.				298° F.				307° F.			
Time, minutes	60	90	120	150	45	60	90	...	30	40	45	60
Elongation	740	620	630	640	750	660	640	...	710	680	630	630
Set, per cent	11	21	28	24	13	24	22	...	15	19	22	20
Tensile	2,755	3,389	3,580	3,267	3,131	3,684	3,153	...	3,353	3,707	3,757	3,253

1.0% HEXAMETHYLENE TETRAMINE

Temperature	287° F.				298° F.				307° F.			
Time, minutes	45	60	90	120	30	40	45	60	30	40	45	60
Elongation	700	690	630	630	680	650	750	620	700	640	620	620
Set, per cent	12	15	21	24	10	14	14	23	17	24	23	20
Tensile	2,713	3,127	3,501	3,305	2,446	3,690	3,398	3,262	3,590	3,807	3,813	3,386

1.25% HEXAMETHYLENE TETRAMINE

Temperature	287° F.				298° F.				307° F.			
Time, minutes	45	60	90	120	30	40	45	60	20	30	45	60
Elongation	710	670	620	620	760	680	680	620	710	670	600	730
Set, per cent	13	18	20	22	10	18	16	22	13	18	21	15
Tensile	3,028	3,511	3,639	3,343	2,609	3,627	3,632	3,342	2,695	3,337	3,211	2,984

SALES METHODS—OLD AND NEW

Old sales methods, popular more than a quarter of a century ago for disposing of surplus stocks, may be revived in some branches of the rubber trade, according to recent reports. Years ago Frederick H. Nazro regularly auctioned off excess stocks of rubber footwear consigned to his firm, and these weekly sales in Boston were events of importance in the rubber industry.

Today tire sales along somewhat similar lines, though on a far larger scale, are being advanced by John H. Diehl, sales manager of The Mason Tire & Rubber Co., Kent, Ohio, with the object of disposing of goods at the end of the motoring season. Ten days will be allowed to Mason dealers throughout the country to sell off their holdover stocks, the time for the sales being uniform throughout the country. Indiscriminate slashing of prices will not be approved, however, as reductions for the sale period will be the same throughout the country.

In this connection it is interesting to note the methods of George K. Culp, Inc., whose plan is to take the surplus production of tires in this country and market it without waste, at minimum overhead costs, through a chain of stores. Culp Plan factory contracts are varied. Some include a minority interest, others include production under "Culp" brands, or production under factory brands, some include entire production, and others, "overflow." The associated factories pool their resources for the purpose of meeting the demand created by the associated distributers and consumers. A comparison of these various sales plans is most suggestive.

PROLONGING THE LIFE OF PRINTERS' BLANKETS

The answer to the question, "Is there something which can be applied to printers' blankets to prevent printing ink from attacking the rubber?" is of great interest to both the rubber and printing trades.

From different sources answers have been compiled. One authority states, "All printing inks will have an effect on rubber blankets, as the rubber tends to soften when it comes in contact with oils. The best way to treat a blanket is to wipe it with a good grade of gasoline, and then rub powdered sulphur into it." Another states, "First cleanse the surface with turpentine, and after drying, dust the blanket with finely powdered soda ash. This method minimizes the chemical action of printers' ink."

Compounded rubber is made much more resistant to the action of all oils by the addition of pitch and litharge. This, of course, will not render the blanket absolutely immune to the effects of oil, particularly if any animal oil is used, but it will put off the ill effects for a long time.

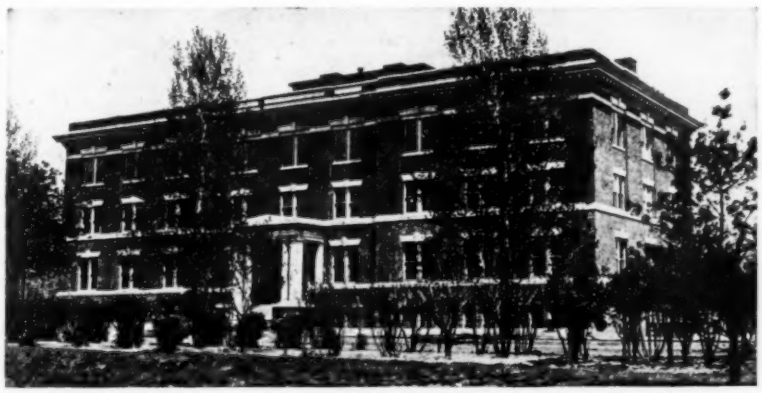
In this connection it is interesting to note that one of the most progressive of British rubber manufacturing companies after many laboratory tests put on the market a liquid called Inkmova, which is claimed to be ideal. It is not inflammable, removes ink instantly and thoroughly, and does not attack the rubber surface as does naphtha, that caused it to swell. In use, cotton waste is dipped in the solution and applied to the inky surface which is then wiped off with any soft, dry absorbent material.

Research and Testing Laboratory of The New Jersey Zinc Co.

A NOTABLE example of the modern scientific research organization in industry is the Research Division of the Technical Department of The New Jersey Zinc Co. The group of laboratories which the Research Division comprises are located in a large concrete, brick-faced building, the design of which is centered on cleanliness and ventilation, as exemplified in the laboratory building of the Bureau of Standards at Washington, D. C.

GENERAL DESCRIPTION

The laboratory building, situated in the center of Palmerton, Pennsylvania, is 130 feet long by 66 feet wide, three stories high with basement. Electric power is received at a sub-station in the basement from the power-house, at 6,600 volts, and delivered to the building switchboard at 440, 220 and 110 volts. There is also a motor generator set for direct current distributed by a three-wire system so that both 220 and 110 volts are available.



LABORATORY OF THE NEW JERSEY ZINC CO., PALMERTON, PENNSYLVANIA

In the basement are located all the general service equipment; chemical supply and receiving room; storage for samples; carpenter shop, machine shop and metal-testing room; and furnace and ceramic room. The numerous laboratories, experimental rooms, library and necessary offices are provided for on the first, second and third floors. Since the rubber industry is more particularly interested in the work and equipment of the Rubber Section, brief mention only can be made of the remainder of the laboratory departments, although each is highly important in the research plan.

DEPARTMENTS

On the first floor are three large analytical laboratories, zinc, hydrogen sulphide and electrolytic laboratories and testing department offices. On the second floor are special and research laboratories, Standards laboratory, rooms devoted to the Metal Section, offices of the Research Division, and the library. The latter comprises a collection of 3,000 volumes and copies of all the important technical periodicals. On the third floor are the physical, pigment grinding, fuel and ore, paint, sales, photographic, microscopic, and analytical and experimental rubber laboratories.

THE RUBBER SECTION

The work of the Rubber Section, like that of the other sections of the Research Division, has reference to developing new pigments; improving the present product; keeping informed about competitive pigments; and guiding the sales and operating departments by technical advice. The Rubber Section also endeavors to advance the interests of rubber goods manufacturers in two distinct ways: (1) By the discovery and development of new methods of test and lines of attack on pigment problems, and the development of a fresh series of deductions to correct and supplement old views and data derived from older and less scientific studies; (2) By applying this new knowledge under practical manufacturing conditions.

The first of these objects is best studied in the laboratory and the second in the experimental manufacturing plant.

RUBBER LABORATORY

The rubber laboratory equipment comprises the usual facilities for analytical examination of rubber, resins, compounding ingredients and pigments, and for the analysis of vulcanized products. Its work deals with competitive products found in the market, as well as those developed in the course of experiment.

RUBBER EXPERIMENTAL ROOM

The equipment here is ample for investigating experimentally problems of mixing, vulcanizing and testing rubber compositions. The machinery includes a motor-driven line of two experimental mills and a calender, steam-heated hydraulic platen press, horizontal steam vulcanizer with temperature control, aging oven, Avery testing machine for measuring tensile properties, and two machines of original design for measuring abrasive resistance of tire treads, soling, heels, etc.

TIRE PLANT

The rubber factory is located within the enclosure of one of the zinc plants at Palmerton. It occupies a one-story structure about 40 by 40 feet with ample overhead space, lighted and ventilated by a monitor roof.

The machinery includes one 16 by 42 mixing mill, one large tubing machine for beads and treads, cutting table, stock-cooling table, building stand, hydraulic press heater with temperature control, tire-stripping table, hydraulic pump, air compressor and overhead crane for handling molds.

There is no calender, all fabric preparation is done in a large commercial tire plant to specification. Calendering of rubber for sidewalls and similar strips is done on the experimental calender.

RUBBER EXPERIMENTAL AND TESTING ROOM

The core and mold designs and details of tire construction were adopted from the practice of a successful American manufacturer and tests are made to show the value of materials used.

The mold equipment permits making 3½ fabric tires and 4, 4½ and 5-inch cord tires. Road tests are conducted on the company automobiles and interesting and valuable results will doubtless be secured. Thus will eventuate improved products for

EXPERIMENTAL TIRE PLANT—REMOVING CURED TIRE

use of the rubber industry, and fuller knowledge of service requirements.

NEW INCORPORATIONS

ACCURATE RUBBER & INSULATION CO., September 29 (Ohio), $15,000. F. A. Clark, 1854 Crawford Road; C. F. and M. A. Heinkel, both of 1181 East 84th street; L. Brown, 1184 East 84th street; R. S. A. Burgeson, 1185 East 84th street—all of Cleveland, Ohio. Principal office, 614 Park Building, Cleveland, Ohio. To manufacture and deal in commercial articles composed of rubber.

Bear Rubber Mills, September 21 (Delaware), $1,000,000. D. E. Cameron; C. Massey; C. J. Kelley—all of San Antonio, Texas. Delaware agent, United States Corporation Co., 311 South State street, Dover, Delaware. To deal in tires, tubes, etc.

Bus Tire Service, Inc., September 24 (New Jersey), $100,000. James, Joseph F. and W. Lynch—all of 552-554 Ferry street, Newark, New Jersey. Principal office, 381 Broad street, Newark, New Jersey. Agent in charge, J. Lynch. To deal in automobile tires, etc.

City Tire Co., August 5 (Illinois), $15,000. T. M. McHale, 1116 Columbia avenue; J. K. Franey, 65 East Harrison street; C. Krutckoff, County Building—all of Chicago, Illinois. Principal office, 65 East Harrison street, Chicago, Illinois. To manufacture, buy and deal in tires and automobile accessories.

Consumer's Automotive Co., July 12 (Idaho), $10,000. H. T. and S. D. Bundy; L. Arras; W. P. O'Connor; H. Burkdoll—all of Nampa, Idaho. Principal office, Nampa, Idaho. To sell tires, tubes and automobile accessories.

Crawford Quick Tire Service, June 11 (Alabama), $3,000. S. J. Bowie; F. A. Neckel; F. Stevens. Principal office, Birmingham, Alabama. To deal in tires, etc.

Di-O-La Corporation, October 12 (Delaware), $500,000. W. Fairchild, New York; I. Ellis; D. C. Beatty—both of San Francisco, California. Delaware agent, American Guaranty & Trust Co., 206 West 9th street, Wilmington, Delaware. To manufacture and deal in syringes, etc.

Englert & Englert, Inc., October 12 (Delaware), $100,000. T. L. Croteau; M. A. Bruce; C. H. Maxwell—all of Wilmington, Delaware. Delaware agent, Corporation Trust Co. of America, Du Pont Building, Wilmington, Delaware. To manufacture and deal in rubber tires, inner tubes and automobile accessories.

Eva Tire Co., H. V., September 1 (Minnesota), $50,000. H. V. Eva, president and treasurer; V. E. Eva, vice-president; A. N. Amundsen, secretary. Principal office, Duluth, Minnesota. To deal in tires.

Fibre Tire & Rubber Co., Inc., October 4 (Delaware), $3,000,000. E. F. Stoeckle, president; C. Dunster, vice-president; L. E. La Bar, treasurer; M. N. Salamon, assistant treasurer; W. B. Holton, secretary. Principal office, 1819 Broadway, New York City. Delaware agent, United States Corporation Co., 311 South State street, Dover, Delaware. To manufacture tires, tubes, etc.

Fogel Tire Co., Inc., August 11 (Illinois), $20,000. R. Fogelson, 1500 West Roosevelt Road; I. Raisman, 1218 North Kedzie avenue; F. Wolfberg, 4919 Glenwood avenue—all of Chicago, Illinois. Principal office, 1500 West Roosevelt Road, Chicago, Illinois. To manufacture, buy and sell tires, tubes and automobile accessories.

Garland Rubber Co., October 1 (Ohio), $10,000. D. McQuate; L. E. Mansfield, both of Ashland; C. H. and F. Mansfield; W. W. McQuate, all of Marion—both in Ohio. Principal office, Marion, Ohio. To manufacture toy balloons and rubber specialties.

Giant Tires Co., October 13 (Delaware), $3,000,000. C. H. Jarvis; L. B. Phillips; M. F. Vance—all of Dover, Delaware. Delaware agent, United States Corporation Co., 311 South State street, Dover, Delaware. To manufacture and deal in tires.

Hayward Rubber Co., September 23 (Delaware), $200,000. W. G. and L. T. Zimmerman, both of Philadelphia, Pennsylvania; E. C. Boyd, Wilmington, Delaware. Delaware agent, H. P. Joslyn, 400 Ford Building, Wilmington, Delaware. To manufacture tires, etc.

Henry Cord Tire Co., September 19 (Ohio), 100 shares capital. R. and E. Burroughs; J. A. Swinehart; M. Rosenblatt; H. R. Farral—all of Akron, Ohio. Principal office, Akron, Ohio. To manufacture tires and tubes.

Hodges Co., The William L., August 4 (Massachusetts), $25,000. W. L. Hodges, president; H. B. Josselyn, treasurer and clerk, both of 783 Beaver street, Waltham; L. H. Josselyn, 2 Waterson Road, Newton—both in Massachusetts. Principal office, Boston, Massachusetts. To manufacture and deal in tires, etc.

Hood Tire Co., June 20 (Oklahoma), $10,000. R. F. Cope; H. P. Cooper; L. S. Jackson—all of Oklahoma City, Oklahoma. Principal office, Oklahoma City, Oklahoma. To manufacture, repair, buy and sell tires.

Jack Tire & Rubber Co., September 19 (Washington), $1,000,000. C. D. Randall; F. B. Donskin; J. B. White. Principal office, Spokane, Washington. To manufacture and deal in rubber materials.

Martin County Tire & Repair Co., June 21 (Minnesota), $25,000. W. J. Knight, president; L. A. Knight, secretary; E. E. Knight, vice-president. Principal office, Fairmont, Minnesota. To deal in tires and automobile accessories.

McClaren Tire Co., The, September 27 (Massachusetts), $25,000. R. W. Johnston, president; P. L. Johnson, treasurer, both of 33 Farquhar street, Roslindale; F. W. Thayer, clerk, 122 Talbot avenue, Dorchester—both in Massachusetts. Principal office, Boston, Massachusetts. To deal in belting, tubing, tires, etc.

Mercury Rubber Co., The, September 26 (Ohio), $10,000. A. C. Fisher, president and general manager; C. W. McDaniel, vice-president and sales manager; P. M. Lynch, secretary and treasurer; R. S. Worthington, assistant sales manager. Principal office, 31 Oakdale avenue, Akron, Ohio. To manufacture and sell tube repair kits, patches and all accessories incidental to automobile tires and tubes.

Merger Tire & Tube Corporation, October 10 (New York), $500,000. E. H. Sturgeon, president, 40 East Mohawk street; J. T. Gilbert, vice-president; R. J. Krotz, vice-president, both of 245 Allen street; J. Knibloe, secretary and treasurer, 507 Brisbane Building—all of Buffalo, New York. Principal Office, 725a Brisbane Building, Buffalo, New York. To manufacture and sell tires and tubes.

National Auto Stores, Inc., July 15 (Delaware), $40,000. W. H. Nichols, president; L. J. Smith, vice-president; B. A. Tuttle, secretary and treasurer. Principal office, South Bend, Indiana. To deal in tires and accessories.

Pacific Coast Tire & Rubber Manufacturing Co., August 22 (California), $2,000,000. Dr. C. E. Calm, president; J. B. Treadwell, vice-president; W. B. Wightman, secretary and treasurer. Principal office, 1139 Merchants National Bank Building, Los Angeles, California. To manufacture tires and tubes.

Penn Rubber Ball Corporation, The, September 30 (Delaware), 50,000 shares without nominal or par value. F. R. Hansell; J. V. Pimm, both of Philadelphia, Pennsylvania; E. M. MacFarland, Camden, New Jersey. Delaware agent, Corporation Guarantee & Trust Co., 927 Market street, Wilmington, Delaware. To manufacture, buy, sell and deal in rubber goods of all kinds.

Progressive Auto Service Co., September 1 (Kentucky), $1,000. L. H. and P. Prescott; R. I. and G. Lynch. Principal office, Louisville, Kentucky. To deal in tires, etc.

R. & G. Rubber Co., Inc., September 24 (New York), $5,000. S. Klein; S. Zimmerman, both of 2 Rector street; H. Booke, 207 West 118th street—both of New York City. To deal in rubber goods.

Racine Tire & Rubber Co., October 10 (Ohio), $50,000. E. F. Peters; S. Geismar; J. E. Moloney; J. G. De Fosset; R. L. Hinds. Principal office, Cincinnati, Ohio. To manufacture and deal in tires, tubes, etc.

Republic Raincoat & Clothing Co., August 20 (New York), $50,000. I. Schwartz, 42 East Broadway; B. Leavitt, 311 East 9th street; D. Kugel, 27 Lenox avenue—all of New York City. To manufacture rubberized clothing.

Roslee Rubber Co., The, September 1 (Ohio), $25,000. L. Schartenberg; I. Brown. Principal office, 227 Ohio Building, Akron, Ohio. To sell rubber toys and novelties.

Sampson-Martin Corporation, October 3 (Delaware), $750,000. W. F. McDermott, New York City; P. M. Kelly, Roselle; T. L. Harrison, Ridgefield Park, both in New Jersey. Delaware agent, Corporation Service Co., Equitable Building, Wilmington, Delaware. To manufacture hot and cold water bottles, ice bags, etc.

Sanitary Bath Curtain Manufacturing Co., August 17 (New York), $10,000. L. Rosenblum, 286 Jerome street; H. Landgarten, 166 Scholes street; L. Feedman, 96 Morgan avenue—all of Brooklyn, New York. To manufacture bath curtains, bags of duck and rubber sheeting, etc.

Schrader's Son, A., of France, September 27 (Delaware), $20,000. M. C. Schweinert, 42 Riverside Drive, New York; P. G. Cole, 63 Greenway North, Forest Hills; H. P. Kraft, Ridgewood—all in New York. Delaware agent, Corporation Trust Company of America, Du Pont Building, Wilmington, Delaware. To manufacture tire valves.

Service Tire & Supply Co., September 1 (Oklahoma), $35,000. J. T. Richards; M. D. Tipton; H. G. Weaver. Principal office, 429 West Broadway, Muskogee, Oklahoma. To sell tires, tubes and automobile accessories.

Snyder Auto Service, October 3 (New Jersey), $100,000. G. A. and L. Snyder, both of 22 Liberty street; C. R. Pancoast, 247 Bloomfield avenue, both of Passaic; A. MacCulloch, 81 Cambridge avenue, Garfield—both in New Jersey. Principal office, 183 Jefferson street, Passaic, New Jersey. Agent in charge, C. R. Pancoast. To deal in tires, tubes, etc.

Springfield Rubber Co., September 20 (Ohio), $10,000. W. F. Nutt; J. J. Anzalone; J. B. Austin; P. C. Leffel; R. F. White—all of Springfield, Ohio. Principal office, Springfield, Ohio. To buy and deal in rubber articles.

Sullivan Sales Corporation, M. S., May 27 (South Carolina), $20,000. M. S. Sullivan, president and treasurer; H. Svendsen, secretary. Principal office, Charleston, South Carolina. To buy, sell and manufacture tires, etc.

Talbott Rubber Co., September 19 (Ohio), $50,000. F. R. Talbott; J. W. Cully; R. S. Lucas; C. A. Crummel; C. C. Craig—all of Cleveland, Ohio. Principal office, Cleveland, Ohio. To manufacture and deal in rubber articles.

Tire Machinery & Equipment Co., Inc., October 17 (New York), $25,000. M. L. Cohn; A. C. Grover; F. J. Leyton—all of 20 Broad street, New York City. To manufacture tire machinery, etc.

Trail Blazers' Association, Inc., September 23 (North Carolina), $100,000. J. G. Isenhour; L. L. Rose; M. K. Thomas—all of Nashville, North Carolina. Principal office, Asheville, North Carolina. To manufacture tires and casings.

Tru-Matic Tube & Tire Manufacturing Co., October 3 (Delaware), $1,000,000. T. L. Croteau; M. A. Bruce; C. H. Maxwell—all of Wilmington, Delaware. Delaware agent, Corporation Trust Company of America, Du Pont Building, Wilmington, Delaware. To buy, sell and deal in rubber tires and tubes.

Velcia Tire & Rubber Co., October 7 (Ohio), $25,000. B. Antonucci; J. Velcio; D. G. Frampton; C. A. Harpman; T. Bennett—all of Youngstown, Ohio. Principal office, Youngstown, Ohio. To manufacture and deal in tires and tubes.

Waterproofing Textiles Corporation, September 16 (Delaware), $250,000. W. Howald; C. T. Clark, both of 118 Fulton street; F. Salzman, 85 East 7th street—both of New York City. Delaware agent, Woodburn Martin, Georgetown, Delaware. To manufacture and deal in waterproof textiles, etc.

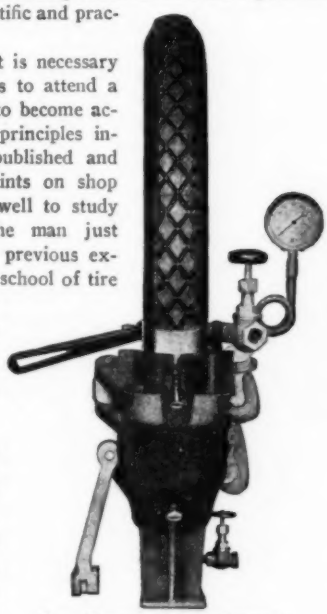
Worthy Manufacturing Co., Inc., October 4 (Massachusetts), $10,000. A. C. Rowe, president, 42 Liberty avenue, Somerville; F. C. and B. L. Heyl, both of 243 Chestnut avenue, Jamaica Plain—both in Massachusetts. Principal office, Boston, Massachusetts. To print, dye and waterproof textiles.

A Better Standard of Tire Repairing

By Roy R. Reid[1]

HAPHAZARD methods and half-knowledge of the principles of vulcanization have shaken the confidence of motorists in repaired and rebuilt casings, and in order to restore this belief in tire repairing, it is absolutely essential that the repairman be thoroughly trained in scientific and practical methods.

This does not mean that it is necessary for the man now in business to attend a vulcanizing school in order to become acquainted with the scientific principles involved. There are books published and many trade journals give hints on shop practices which he will do well to study and observe. However, the man just starting in business with no previous experience should first attend a school of tire repairing and thoroughly master the profession. The success attained by graduates of such schools has already proved the advisability of such training.



ONE-THIRD CIRCLE RETREAD MOLD IN OPERATION

The man selling new tires who looks on the repair business as a "necessary evil" to the sale of tires had better not do any repairing at all, because it is more than likely that he has a lot to learn before his repairs will give satisfaction. An expert repairman with a practical equipment are "lodestones" that will draw dollars, both in the sale of new tires and in the repair and rebuilding business itself.

From extensive observation in various repair shops it appears that it is the seemingly "little things" in shop practice that are overlooked by the ordinary repair man. It is to the oversight of "little things" and the taking for granted that it will come out all right anyway that most repair failures can be attributed; consequently, this is an effort to correct such impressions and to emphasize the necessity of observing all principles which have been proven by years of experiment in repair schools and experimental departments of manufacturers of repair equipment and new tires.

CAREFUL INSPECTION ESSENTIAL

Proper inspection of a casing before repairing or rebuilding is the first and most essential operation. The repair man is responsible if he repairs a blowout or local condition in a tire without assuring himself that the balance of the casing needs no attention. A thorough inspection entails examination both inside and out for various abuses and ailments. Determine their cause and the advisability of a repair which will save the customer money on the additional mileage obtained.

To inspect the inside of a casing spread the beads apart with a tire spreader if the beads are stiff and look closely for fabric breaks, checked fabric, separated plies, loose cords, etc. By flexing the beads one may find whole or partial rim cuts or broken beads. Flexing the tread or hinge point below the edge of the tread may disclose tread cuts, worn tread, punctures, separated treads, etc. Look the entire casing over carefully for unnatural tread wear, fender cuts, sidewall cuts, chain wear, etc.

CAUSES OF INJURIES

Be able to tell the customer what causes injuries; he will appreciate it by giving you his business.

Blowouts from bruises are caused by hitting obstructions in the road, the shock causing the fabric to stretch beyond its elasticity. The blowout may not result immediately, but after further running.

Fabric breaks and separation of plies are due to underinflation, overloading, running in car tracks, or striking objects.

Rim cuts result from overloading, underinflation, crooked rims, turning corners sharply, throwing the weight on one side of the car, and mounting straightside beads on quick-detachable rims.

Stone bruises are caused by backing against curbs and rough, uneven roads.

Separated treads and sidewalls are the result of neglected cuts into which sand or the elements penetrate and deteriorate the gum.

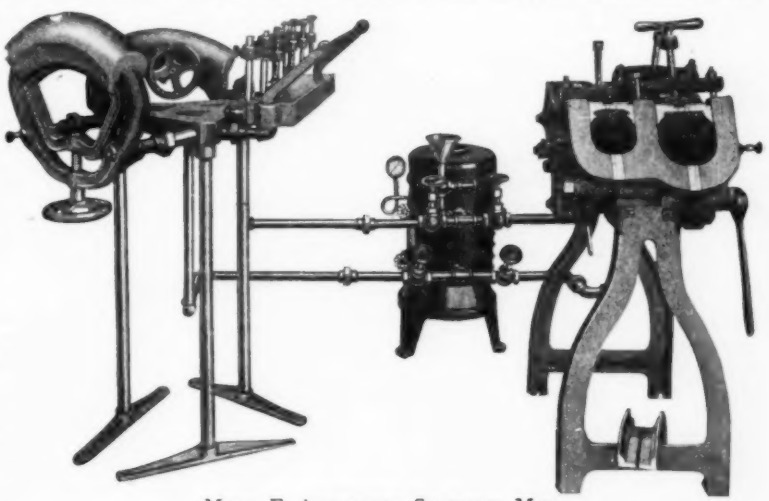
Tread cuts result from running over sharp objects of any kind.

Unnatural treadwear comes from jamming on the brakes, starting with a jerk, misalinement, car tracks, under or overvulcanization.

Broken beads are due to hammering the bead with a heavy blow when applying, or turning corners sharply, the car being out of balance.

TIRE CONSTRUCTION

There are five principal parts to a tire, namely: carcass, tread, beads, sidewalls and breaker strip. The carcass consists of layers of cord or regular fabric laid together on the bias, and previously impregnated with rubber to hold the plies together and prevent chafing. Cord fabric is made of strong cords laid side by side with widely spaced cross-threads holding them together. Regular building fabric is woven. Both are impregnated with rubber.



MODEL F, ADJUSTABLE SECTIONAL MOLD

The beads hold the tire on the rim. They are of three types—regular clincher, quick-detachable clincher and straightside. The regular clincher is most common on small sizes; the straightside, on larger sizes. The regular clincher bead is composed of a core of rubber over which the edges of the fabric or cord lap and form

[1]Western Rubber Mold Co., 243, 321-323 North Crawford Avenue, Chicago, Illinois.

a shoulder which fits into the up-curved edges of a clincher rim. The straightside bead is not elastic, being composed of twisted or plaited wire insulated with rubber. Being non-elastic it needs no projecting shoulder to hold it on the rim, and straightside rims do not curve over as the clinchers do. The quick-detachable

MULTIPLE TENSION INSIDE VULCANIZER ATTACHED TO SECTION MOLDS

clincher is a combination of the other two types, and is fast becoming obsolete in America.

The sidewall is a covering of rubber that protects the side of the tire from the elements, curb wear, etc. The breaker strip is the shock absorber that protects the carcass from the sharp knocks and bumps of the road and holds the tread to the carcass. The tread is formed of rubber compounded to resist wear on the road.

CORD VS. FABRIC

Cord tires are built up of fabric plies in two ways—one, where the cords of each successive ply cross those of the other, and the other, where the plies are in groups of two to four, with the cords running in the same direction, the next group being reversed. Cords were originally 1/16 to 1/8-inch in thickness, but these are practically obsolete, the 1/32-inch cord being the only size now used in standard cord fabric. Since each strand is impregnated with rubber, friction has been reduced to a minimum. Greater resiliency is added, consequently the cord is the longest-lived tire and should be closely studied by the repairman.

The fabric tire is made up of plies of woven fabric "frictioned" on each side and usually skim-coated on one side with rubber. It can be seen, therefore, that where the strands cross each other there is a constant chafing, consequently a greater heat is generated in the fabric tire.

REPAIRING BLOWOUTS

Repairing the cord tire differs little from the fabric. The main things to take into consideration are the direction of each layer of cord and to make sure that the lap runs in the same direction as the ply it laps on. Instead of barely lapping the cord fabric, each ply should lap one inch. Another important point is the anchor strip, necessary to keep the tire from giving away at the beads and causing a blowout.

It will be understood that the first method given for repairing a blowout applies to fabrics. The different principles applying to cord repairs will be explained after the fabric method is given.

REPAIRING BLOWOUTS IN FABRIC TIRES

INSIDE METHOD

The inside method should be used in repairing blowouts when the injury is not too near either bead and sufficient purchase can be obtained by allowing the widest ply to extend over the bead. This method is most economical, both in labor and material, and does not give a repaired appearance to the casing. Of course, the inside method should never be used when the tread is gone at the point of repair and the outside plies are so badly worn or broken that to remove inner plies would take out the best plies of the tire.

The number of plies to be removed is determined by the size of the casing and extent of the injury. Up to 4-inch tires, two plies are all that is necessary; above this size, three plies, but this is largely a case of judgment as to the strength needed.

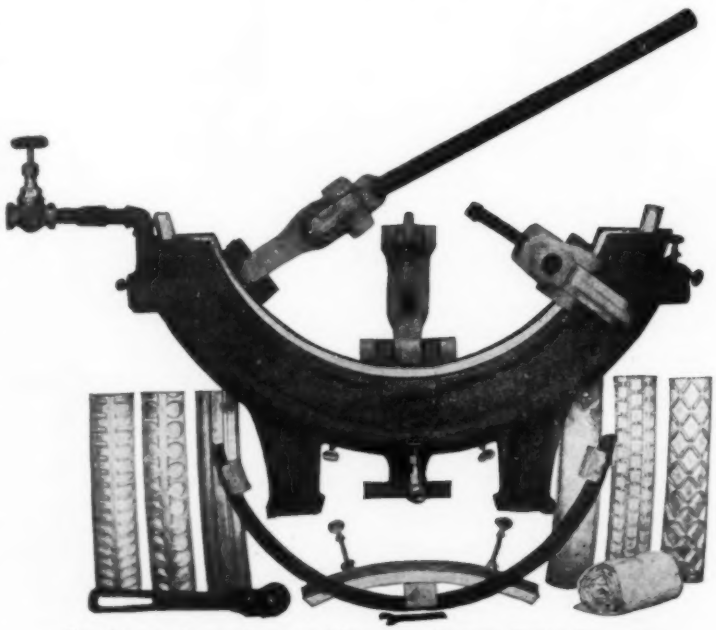
The first step should be two and one-half inches from the edge of the blow, and each successive ply, one inch farther. When the last ply is removed, clean and buff the inside of the casing and apply at least two coats of cement, first coat light, second heavy. If the cement is of a nature to require more than two coats, give it a light third coat. Allow each coat to dry thoroughly.

Fill up the break with cushion gum and run a layer of cushion about one-half inch wide around the edge of the break. Fill in each ply of fabric, lapping about 1/8 of an inch. Add one or two plies more than were removed and on large blows or when close to one bead, lift the chafing strip and lap the last ply across the flat part of the bead.

OUTSIDE METHOD

When an inside section will not give sufficient strength, employ the outside method for repairing. First determine the number of plies of fabric to be removed by the following table:

If the casing has 4 plies, remove 2 plies
If the casing has 5 plies, remove 2 plies
If the casing has 6 plies, remove 3 plies
If the casing has 7 plies, remove 3 plies
If the casing has 8 plies, remove 4 plies



ONE-THIRD CIRCLE RETREAD MOLD AND VARIOUS TREAD DESIGNS

To determine how far each way to remove the sidewall rubber and to peel back the tread, measure 4½ inches from each edge of the break, when two plies are to be removed; 5½ inches for three plies; 6½ inches for four plies. Cut the sidewall rubber down to the fabric on each side of the tread, just below the breaker and make a layback of the tread by cutting across diagonally, lifting up with a screw driver and peeling back tread and breaker. Hold the tread back with double pointed hooks made of soft wire. If the tire is to be retreaded, peel off the tread entirely. Cut down the sidewall rubber where marked, taking care not to cut the fabric. Cut inside of this about one inch and peel off the strip of rubber.

With the notched knife cut one ply of fabric from toe to toe of the bead ½-inch from where the sidewall rubber was removed, and by lifting up with a screw driver at the corner, peel off with pliers. Cut the next ply on a margin of one inch from the first cut, and if more plies are to be removed have a one-inch margin for each succeeding ply. The last ply taken out should be two inches from the edge of the blowout.

If the cut is very large or in the center of the tread, go over both beads; if it is on the side, go over one bead and to the opposite side of the tread, below the flexing point of the tire.

Buff all parts of the casing inside and out, bevel the old rubber and buff the under side of the tread. Wash with high-test gasoline and give three coats of cement, first and last light, second heavy. Allow each coat to dry thoroughly. Cover with cushion stock outside, roll and prick out all air bubbles.

Replace the removed plies of fabric with new plies, lapping the joints of first plies ¼ of an inch and last ply ¾-inch on outside ply. Allow the last ply to go over the toe of the bead and lap inside ½-inch. Replace the chafing strip, lapping one inch up on the sidewall from the heel of the bead and one inch inside. Replace the sidewall with one ply of 1/16-inch stock ½-inch above the crotch of the bead and up to tread. Cover exposed fabric with cushion under tread. Apply a strip of cushion on the edges and replace the tread, rolling down securely. Fill in a strip of 1/16-inch stock at the tread if the thickness of the sidewall makes it necessary. Fill in the splice of the tread with one ply of cushion and the balance with tread stock. Skive all rough edges. Fill up the cut with cushion inside of the tire and put a three-ply shoe inside. Be sure the shoe laps about 1½ inches beyond the widest ply of fabric outside and extends from toe to toe of the beads.

When a casing is ready for curing, open the escape valve at the end of the mold to be sure of dry blue steam. If the tread is all intact, pack it with a soapstone mash or wood pulp and plaster of Paris mash to keep from flattening out the anti-skid design.

Before inserting the air bag inside of the casing, soapstone the inside of the casing freely to prevent the air bag sticking to the repair. Regardless of the number on the air bag take particular care to see that the size of the bag is neither too large nor too small. Should it be too small and the next size too large, it will be necessary to pad out with plies of rubber or old fabric. A little experience will soon teach one when an air bag fits a casing properly.

If a tire is a clincher, place the bead molds over the beads at the section that is to be repaired, dividing the molds up equally on the repair. Dust soapstone into the mold and on the tire to prevent sticking to the mold. Then place the tire in the mold, adjust the cavity clamp and tighten it down until the bead mold fits snugly on the tire. Then inflate the air bag from 65 to 80 pounds, according to the size of the tire, and cure as recommended for the stock used.

To remove the casing from the mold, first release the air from the bag, then loosen the cavity clamps, and if the tire is of the clincher type, lift the tire and bead plates from the mold together. In placing a straightside tire in the mold and removing it, the bead plates may be placed on the tire after the tire is put in the mold and removed before taking the tire out of the mold.

A piece of old flap used on top of the air bag where the bead molds come together will add greatly to the life of the air bag. Always use the same size bag in a certain size and style of casing for best results. Use one air bag for straightside, and another for clincher casings. Allowing the bag to remain in the same shape all the time increases its life. The air bag should be two inches shorter than the cavity of vulcanizer in which it is used. Always discharge air from the bag before loosening the clamps or removing it from the tire. Never handle the air bag by its stem.

REPAIRING BLOWOUTS IN CORD TIRES

Cut down sections on any cord tires, except the old-style cords, in the same manner as for cutting down fabric tires. In replacing the plies where they are arranged in groups instead of alternately crossing each other, it is necessary to take care that the new cords run in the same direction outside as the group removed. The tire should always be reinforced inside with a shoe of the same number of plies of cord running in the same direction as those removed from the outside.

A large blowout in a cord tire should be cut down for a full section by the outside method, but cuts or punctures of not more than one inch in length may be repaired from the inside, without disturbing the tread, by the application of a cord patch built up of alternate plies of cord fabric. The injury on the outside of the tire should be skived out clean with a rat-tail file, then cemented and filled up in the same way as explained for tread cuts on fabric tires.

Cure all sections over the inside vulcanizer, as well as in the section mold.

REPAIRING OLD-STYLE TWO AND FOUR-PLY CORD TIRES

The old style cord differs from other cord tires in that there are only two to four plies of fabric. In repairing two-ply tires it is necessary to remove only the cords that are injured. If the injured cords are on the outside, make a layback the same as on any other tire. Remove the plies of cord from bead to bead. If the inside plies are the only ones affected, they may be removed from the inside without disturbing the outside of the tire. The tire may then be buffed and cemented and replaced with the same number of cords of the same size and type as those removed. The number and type are stamped on the sidewall of the tire. If these cords are not obtainable from another tire or from the manufacturer, and the number of cords removed should be not more than ten, it may be repaired by laying in strips of cord fabric, entirely filling up the space.

Where not more than four cords are broken in one place, they may be replaced without removing the cord from bead to bead, by simply stepping out all but one broken cord, breaking the splices in different places an inch apart. Do not attempt to repair this nature of injury on more than four cords. Always use a 1/16-inch ply of cushion gum between the two-ply cords and under the breaker.

Repairing a blowout on the four-ply cord is different from the two-ply repair in that one outside ply and one inside ply are removed and reinforced inside with a cord patch of alternate plies of cord fabric. When one ply only is affected, remove only that ply, if it is outside or inside, otherwise reinforce inside with a cord shoe.

MASON CORD TIRES REDUCED FIFTEEN PER CENT

A price reduction of 15 per cent on Mason cord tires and tubes, which includes a reduction on solid truck tires to lower than pre-war prices, became effective October 18. Mason tires are, according to announcement, handled by more than 6,000 dealers.

Magnesium Carbonate as a Compounding Ingredient in Rubber

A Brief of Experimental Investigation at the Mellon Institute of Industrial Research of the University of Pittsburgh, by the Magnesia Association Fellowship

CALCINED magnesia, magnesium oxide, has long been used as an inorganic vulcanization accelerator, and the rubber industry has used some quantities of basic magnesium carbonate as a compounding ingredient and as an auxiliary aid to vulcanization with organic amino accelerators; but in view of the fact that the carbonate of magnesia has such a remarkable reinforcing effect upon rubber and imparts to it physical properties which seem to be characteristic of this filler alone, it appears that rubber manufacturers have given this material insufficient study and attention. Therefore, it seemed advisable to make a complete study of the physical properties and aging qualities of rubber compounded with basic magnesium carbonate, with various inorganic and organic accelerators, and in combination with other commonly used compounding ingredients.

MAGNESIA IN GENERAL

Light carbonate of magnesia, identical with the "magnesia alba" of the pharmacist, is a basic hydrated magnesium carbonate, having approximately the composition represented by the formula, $4MgCO_3.Mg(OH)_2.5H_2O$. In the process of manufacture it results as a bulky precipitate from boiling a solution of magnesium bicarbonate, and its composition varies with the conditions of precipitation, but is quite constant when rigid control of these conditions is maintained, particularly the concentration of the solution and the rate of heating. Corresponding to this composition the pure basic magnesium carbonate will show an ignition loss, on samples free from hygroscopic moisture, varying from about 54.5 per cent to 56.8 per cent. By heating at 265 degrees C. for 24 hours, practically all the combined water may be driven off without causing any appreciable further decomposition of the carbonate or loss of carbon dioxide. The pure material will ordinarily contain only traces of iron and alumina and should not show on analysis more than a small percentage of lime as calcium carbonate.

The commercial light magnesium carbonate is an extremely finely-divided, white inert powder. It is very insoluble, only about 0.035-gm. of the oxide dissolving in one liter of water. The individual particles of the carbonate have a distinct acicular crystalline form. When the carbonate is pulverized in the manufacturing process, many of the crystals are broken up and the interlaced snowflake aggregates are completely dispersed. Under the microscope the powder is found to consist mainly of particles having a diameter of 1 micron or smaller, with some larger crystals. The size and uniformity of the particles vary in the product from different manufacturers, depending upon the conditions of precipitation and the completeness of the pulverization process. The pure material is very bulky, enclosing several times its own volume of air, and has an absolute density of 2.18.

It should be noted here that the properties of the precipitated magnesium carbonate are entirely distinct from and superior to those of ground magnesite rock, with relation to their effect on the physical properties of rubber, since the latter is very coarse and has no value other than that of an inert diluent.

ONE OF THE ACTIVE FILLERS

The experimental work on the use of basic magnesium carbonate as a compounding ingredient has shown that it belongs definitely to the class of reinforcing pigments, designated sometimes as "active" fillers. Included in this class are also zinc oxide, gas black, lampblack and the finer clays. The general effect of the addition of magnesium carbonate to a rubber compound is to stiffen, harden and toughen it, while at the same time increasing the tensile strength, when not used in excessive amounts. In rubber cured with 5.0 per cent of sulphur and containing sufficient litharge as accelerator, to give a flat "state of cure" curve over a vulcanization period of 40 to 50 minutes at 42 pounds steam pressure (143 degrees C.), the maximum reinforcing effect is given by 9 volumes of magnesium carbonate per 100 volumes of rubber, corresponding to about 21 parts by weight on the rubber. With a pale crêpe rubber basic mix having a tensile strength of 2575 pounds per square inch, the addition of 9 volumes of magnesium carbonate increases the tensile strength to 3000 pounds. The ultimate elongation is decreased by the same addition from 700 per cent to 655 per cent, giving a rubber which is appreciably less resilient. The tensile product is increased from 205 to 227, but the real significance of the reinforcing effect is more forcibly shown by the results of the application of the concept and method of W. B. Wiegand to the study of resilient energy capacity.

The basic mix described above shows resilient energy capacity of 318 foot-pounds per cubic inch of the compounded rubber, while a compound containing 9 volumes of magnesium carbonate shows 475 foot-pounds energy capacity, or an increase of 49 per cent. The stress-strain curve for rubber so compounded is quite flat over the greater portion of its length, and except for the first stresses applied shows a behavior very nearly in accord with Hook's law, that is, proportionality of stress to deformation. The total energy of resilience being derived from the area between the stress-strain curve and the elongation axis, it is not difficult to understand why rubber compounded with magnesium carbonate shows high energy of resilience, since the stock has high tensile strength, high ultimate elongation and a fairly flat stress-strain curve; therefore, the area included in its projection on the elongation axis is large. Total energy of resilience, according to Wiegand, is a measure of ability to resist abrasive wear, and it is quite apparent that magnesium carbonate has a definitely beneficial effect on this property of rubber.

VIEWED AS A COMPOUND INGREDIENT

In rubber compounded with magnesium carbonate the tensile strength does not become less than that of the basic mix until 20 volumes of the filler have been added per 100 volumes of rubber, and then falls off quite uniformly with further additions of the filler. The tensile product falls below that of the basic mix when 15 volumes are used, owing to the great stiffening effect of this filler, but it is noteworthy that the total energy of resilience—index of resistance to abrasive wear—is greater than that of the basic mix until more than 25 volumes of filler have been used.

Magnesium carbonate cannot be used as a white pigment in rubber, due to the fact that it has practically no pigmenting effect or covering power when compounded. It is so neutral in its effect that a sheet of rubber compounded with only 20 volumes of magnesium carbonate will be nearly as translucent, until made opaque by "blooming," as rubber containing no filler whatever. This may be of value in preparing colored rubber articles, where a reinforcing filler is necessary and it is desired to use one which will not mask the pigment used for coloring, making the use of a larger amount of color necessary.

Rubber compounded with magnesium carbonate has naturally a very low specific gravity, due to the low density of the filler. This is a particular advantage in the case of many rubber articles for personal use, such as boots, shoe soles, and heels, where the combination of high tensile properties, resilience, wear resistance and lightness is desirable.

AS TO ITS LIMITATIONS

There are two natural limitations on the use of magnesium carbonate as a compounding ingredient. The first is that, because the maximum reinforcing effect is obtained by the addition of only about 21 parts by weight of the filler to 100 parts of rubber, it will not be most economical to use this filler for its reinforcing effect in greater proportions than that, unless it is desired to make a particularly stiff rubber. Magnesium carbonate, at present prices, costs somewhat more per unit of volume of the finished product than does the rubber entering into it, and must, therefore, be used only for its reinforcing effect and not as a diluent. When an inert filler is needed and no reinforcing effect desired, it will, of course, be cheaper to use materials such as clay, barytes, or precipitated chalk.

The second limitation of the use of magnesium carbonate lies in the fact that this material imparts high permanent set to rubber. This seems to be related quite closely to the definitely crystalline character of the magnesium carbonate particles. When the permanent set test is carried out according to the method recommended by the Physical Testing Committee of the Rubber Division, American Chemical Society, it is found that 9 volumes of the filler produce a permanent set of 23.0 per cent, while 30.0 per cent set results when 20 volumes of the filler are used. The explanation usually offered for the high permanent set effect is that, when the rubber is placed under tension, the crystals shift their positions, due to the poor bonding between the particles and the rubber matrix, so that when the tension is released the rubber cannot return to its original position. With larger proportions of filler the interlocking of the crystals with each other when the stress is removed may account for the higher set values obtained.

MIXING MAGNESIUM OXIDE AND ZINC OXIDE

An experimental study of the physical properties of rubber compounded with mixtures of zinc oxide and magnesium carbonate, containing 20 volumes of total filler, for the purpose of comparing the effect of these two fillers, has shown that magnesium carbonate gives tensile strength and resilient energy capacity equal to that obtained by the use of an equal volume of zinc oxide, while mixtures of the two fillers give slightly higher values for these properties than when either one is used alone. The magnesium carbonate stocks and the stocks containing the larger proportions of this filler are quite appreciably stiffer and harder than the stock containing zinc oxide alone.

AGING QUALITIES IN RUBBER COMPOUNDS

As far as the investigation of the aging qualities of rubber compounded with magnesium carbonate has been carried, it has been found to compare quite favorably with zinc oxide, both by the accelerated aging test and weathering tests, especially when the magnesium carbonate replaces only about half the zinc oxide in the compound.

HIGH TENSILE STRENGTH OBTAINED

Mention of the use of magnesium carbonate as a compounding ingredient in rubber has seldom been made in the literature of rubber chemistry, and, with the exception of a recent paper by C. O. North, practically no data regarding its effect on the physical properties have been published. North's results are, in general, in quite good accord with those described above, although his cures were made with rubber and sulphur alone and could not, therefore, be expected to give identical results, nor may all his figures be strictly reproducible in technical mixes. His data show, however, that magnesium carbonate gives high tensile strength. For ultimate elongation, however, he obtained higher values than have been obtained in this work and his data indicate that zinc oxide gives less resilient rubber than does magnesium carbonate, whereas in this work the opposite has been found to be the case. This difference may be explained by the fact that North used one grade of zinc oxide and in this work a quite different grade was used, with litharge as an accelerator. He laid particular emphasis on the fact that magnesium carbonate, when used in suitable proportions, 6 to 15 volumes per 100 volumes of rubber, gave the highest tensile product of any of the reinforcing pigments he studied. Tensile product, "corrected" to the basis of 100 per cent rubber, was also highest for magnesium carbonate in the same proportions. The high permanent set given by magnesium carbonate appeared to him as the principal reason why larger quantities of this filler have not been used.

9,245,195 Motor Cars and Trucks Registered First Six Months, 1921 *

By Andrew P. Anderson†

A TOTAL of 9,245,195 passenger cars, trucks and commercial vehicles and also 28,114 trailers and 177,234 motor cycles were registered in the 48 states and the district of Columbia, during the six months, January 1 to July 1, 1921. As a result of these registrations and the licensing of chauffeurs, operators, etc., the several states collected during this period a total gross revenue amounting to $108,213,165.33.

While the present registration figures are not fairly comparable with those for the year 1920, it is interesting to note that on July 1 of this year there had been registered 13,244 more cars, but 61,868 less motor cycles, than were registered during the entire year of 1920. Of the several states 21 already show an increase over and above the total registration for 1920, while only 12 states show a decrease of more than 5,000 cars each. This decrease is probably due in part to leniency in enforcing the registration provisions during the present financial depression and in part to the fact that not a few people owning cars or trucks have found it financially impossible or inadvisable to operate these vehicles and have let them remain in the garage.

At the present time every state requires an annual registration of all passenger cars, trucks or commercial vehicles and motor cycles before they can be used on the public roads. Minnesota, the last state to require annual registration, passed such an act this year which became effective on April 15.

The total registration revenues collected in 1920 amounted to $102,546,212.25. The registration revenues collected to July 1 of this year amounted to $108,213,165.33, an increase of $5,666,-953.08 over those collected for the entire year 1920. Of the 1920 registration revenues a grand total of $97,671,742.10, or 95 per cent of the gross receipts, was available for road work. Of the registration revenues collected during the first six months of this year $101,793,416, or 94 per cent of the gross receipts, is available for road work, either by the state highway departments or the local road officials. This apparent percentage decrease is due to the fact that in some states the funds do not become available until the close of the year. Of the total devoted to road work in 1920, 79 per cent was expended by or under the supervision of

*Public Roads, September, 1921. Published by the U. S. Department of Agriculture, Bureau of Public Roads, Washington, D. C.

†Highway engineer, Bureau of Public Roads, Washington, D. C.

the state highway departments. During the first six months of 1921 this proportion had increased to 81 per cent.

TWELVE STATES HAVE PROVIDED FOR A TAX ON GASOLINE

The motor vehicle has also proved to be an indirect source of road revenues in a large number of states. Prior to this year, Colorado, Kentucky, New Mexico, and Oregon had levied a tax on gasoline. During the present year the states of Arkansas, Arizona, Georgia, North Carolina, Pennsylvania, South Dakota, and Washington have passed a gasoline tax, while other states have the question of passing such a tax under consideration. The state of Louisiana has written such a measure into its new constitution.

Only 13 states gave definite information as to the sizes of the trucks and commercial cars registered during the six months. These data are given in Table 1. They are, however, not directly comparable due to the following reasons: So far as legislative registration enactments are concerned there is as yet no universally accepted standard as to what constitutes a motor truck. In some states all motor cars are registered on the same basis; in others only cars having solid tires are classed as trucks, while in others all motor vehicles used for carrying freight or merchandise of any kind whatever are classed as trucks. Even those states which provide for a separate registration for motor trucks do not employ the same basis for designating the size of the vehicle. Some states use the total weight of the loaded vehicle, others the weight of the unloaded vehicle or the weight of the chassis, and still others use such indefinite bases as the horsepower, or the cost of the vehicle.

It is interesting to note, however, that of the 10 states reporting a total of 91,488 truck and commercial car registrations based on rated carrying capacity, 46.8 per cent were 1 ton or less, 48.2 per cent were between 1 and 3-ton, 4.6 per cent between 3 and 5-ton, and only 0.4 of a per cent over 5-ton capacity. Two states having a total of 50,072 truck and commercial car registrations based on the total loaded weight of the vehicle show the following grouping: One ton or less, 53 per cent; 1 to 3-ton, 29 per cent; 3 to 5-ton, 11 per cent; 5 to 8-ton, 6 per cent; and above 8-ton, only 1 per cent. One state having a total of 51,503 truck registrations based on weight of chassis shows the following grouping: Between 1 and 3 ton, 81.8 per cent, between 3 and 5 ton, 17.7 per cent, and only 0.5 of a per cent over 5 ton.

The registration of passenger cars, motor trucks, and commercial vehicles, taxis and buses, trailers and motor cycles is given in Table 2. Nine states still fail to segregate their registration data so as to show the number of trucks or commercial cars within their borders. Only 7 states and the District of Columbia reported the number of taxis and buses, and only 19 states had any data as to the number of trailers.

TABLE 1. TRUCK AND COMMERCIAL CAR REGISTRATION BY SIZES

	Carrying capacity in tons							
State	1 ton or less	1 to 3	3 to 5	5 to 8	8 to 10	10 to 12½	12½ tons or over	Total registrations
Alabama	3,808	4,471	363	.....	.....	.....	.....	8,642
Arizona	2,880	533	60	[2]	.....	.....	.....	3,475
Connecticut[1]	[2]	21,298	2,001	272	.....	.....	.....	23,571
Maine	4,146	635	287	1	.....	.....	.....	5,069
Minnesota[3]	9,000	4,000	.....	.....	.....	.....	.....	13,000
Nebraska[4]	12,000	3,000	998	.....	.....	.....	.....	15,998
New Jersey[4]	14,549	10,268	4,745	2,948	564	.....	.....	34,074
New Mexico	844	281	52	1	.....	.....	.....	1,178
Pennsylvania[5]	[2]	42,095	9,122	286	.....	.....	.....	51,503
South Carolina	4,760	1,749	63	.....	.....	.....	.....	6,572
South Dakota[1]	[2]	[7]7,742	[7]64	.....	.....	.....	.....	7,806
Vermont	2,474	549	55	3	1	.....	3	3,085
Wisconsin	14,965	2,899	[8]1,235	.....	.....	.....	.....	19,099
Total	69,426	100,520	19,045	3,513	565	.....	3	193,072

[1]Data for year 1920.
[2]Included in column "1 to 3."
[3]Data approximate.
[4]Distribution based on total loaded weight.
[5]Distribution based on weight of chassis.
[6]Two tons and less.
[7]Between 2 and 5 tons.
[8]Three tons and over.

TABLE 2. MOTOR-VEHICLE REGISTRATIONS JANUARY 1 TO JULY 1, 1921

State	Total car and truck registrations	Passenger cars	Trucks and commercial cars	Taxis and buses	Trailers	Motorcycles
Alabama	78,761	66,252	8,867	3,642	.....	778
Arizona	30,175	[1]26,328	[2]3,475	372	.....	376
Arkansas	58,676	58,287	[3]389	.....	8	136
California	538,863	537,231	31,632	.....	2,661	15,161
Colorado	119,867	112,783	7,804	.....	38	2,103
Connecticut	114,643	93,548	[4]21,095	.....	.....	2,759
Delaware	18,800	18,800	([5])	.....	56	500
District of Columbia	42,377	[6]35,654	[7]5,448	1,275	.....	2,487
Florida	89,795	76,323	13,345	127	([8])	1,153
Georgia	118,552	118,652	([8])	.....	.....	1,023
Idaho	46,035	46,035	([8])	.....	.....	750
Illinois	580,345	512,541	67,804	.....	.....	7,243
Indiana	344,890	309,450	35,440	.....	1,401	5,739
Iowa	435,356	[9]407,084	28,272	.....	313	3,406
Kansas	287,393	267,933	19,460	.....	.....	3,398
Kentucky	103,493	94,414	9,079	.....	.....	1,034
Louisiana*	71,000	64,000	7,000	.....	.....	490
Maine	66,133	57,874	8,259	.....	.....	1,172
Maryland	132,273	122,550	9,472	251	195	[10]4,062
Massachusetts	300,027	250,778	49,249	.....	401	10,013
Michigan	426,460	[11]382,432	[12]44,028	.....	3,382	5,252
Minnesota	283,000	[13]270,000	13,000	.....	7,684	3,000
Mississippi*	56,114	48,100	8,014	.....	.....	122
Missouri	305,802	[14]305,802	([8])	.....	.....	3,081
Montana	51,500	51,500	([8])	.....	.....	373
Nebraska	215,909	199,861	16,048	.....	232	1,419
Nevada	8,688	8,688	([8])	.....	.....	104
New Hampshire	37,170	37,170	([8])	.....	.....	1,919
New Jersey	237,339	214,940	22,399	.....	759	8,295
New Mexico	19,661	18,483	1,178	.....	.....	152
New York*	675,530	505,642	144,888	25,000	4,000	22,580
North Carolina	147,910	133,846	14,064	.....	([8])	1,534
North Dakota	86,310	84,942	1,368	.....	.....	676
Ohio	628,283	[15]547,000	77,000	4,283	4,775	[16]23,300
Oklahoma	177,300	168,300	9,000	.....	.....	628
Oregon	102,274	102,274	([8])	.....	.....	2,486
Pennsylvania	609,268	557,765	51,503	.....	1,560	18,174
Rhode Island	46,574	37,676	8,898	.....	16	1,524
South Carolina	82,447	[17]75,875	6,572	.....	44	643
South Dakota	117,800	110,000	7,800	.....	.....	750
Tennessee	98,924	86,610	12,314	.....	.....	845
Texas	412,332	[18]412,332	([8])	.....	.....	3,219
Utah	41,136	35,730	5,406	.....	.....	792
Vermont	32,871	29,786	3,085	.....	([8])	847
Virginia	124,000	110,000	14,000	.....	.....	1,800
Washington	162,287	136,205	23,374	2,708	577	2,924
West Virginia	91,204	78,002	[19]13,202	.....	.....	1,220
Wisconsin	315,864	296,765	19,099	.....	.....	5,505
Wyoming	23,694	21,184	2,500	.....	12	2 87
Total	9,245,195	8,363,427	844,110	37,658	28,114	177,234

*Estimated.
[1]Does not include 109 non-resident passenger cars.
[2]Does not include 6 non-resident motor trucks.
[3]Registration became effective May 1, 1921.
[4]Includes motor buses and trailers.
[5]Included under passenger cars.
[6]Does not include 16,979 non-resident passenger cars.
[7]Does not include 1,528 non-resident motor trucks.
[8]Included under motor trucks.
[9]Does not include 821 non-resident passenger cars.
[10]Does not include 2,053 motor bicycles and side cars.
[11]Does not include 198 non-resident passenger cars.
[12]Does not include 216 non-resident motor trucks.
[13]Does not include 200 non-resident passenger cars.
[14]Does not include 268 non-resident passenger cars.
[15]Does not include 82,798 non-resident passenger cars.
[16]Includes side cars.
[17]Does not include 50 non-resident passenger cars.
[18]Does not include 339 non-resident passenger cars.
[19]Includes taxis, buses and trailers.

S. A. E. PROPOSED STANDARD TIRE SIZES

The Tire and Rim Division of the Society of Automotive Engineers proposes to limit the tires and rims for passenger cars and motor trucks to a few standard sizes. While the proposition has met with the approval of The Rubber Association of America, it has still to be passed upon by the National Automobile Chamber of Commerce and the Society of Automotive Engineers. The proposed tire and rim sizes are as follows:

Rim		Tire Size		
Size	Type	Regular	Oversize	Tire Seat Diameter
30x3½	C	30x3½	31x4	23
30x3½	SS	....	31x4	23
32x4	SS	32x4	33x4½	24
32x4½	SS	32x4½	33x5	23
34x4½	SS	34x4½	35x5	25
34x5	SS	34x5	36x6	24
36x6	SS	36x6	38x7	24
38x7	SS	38x7	40x8	24
40x8	SS	40x8	42x9	24
44x10	SS	44x10	....	24

Rubber Shock Insulators For Buses[1]

THE automobile passenger bus mounted on solid tires affords comfortable riding only under the most favorable conditions when the shocks on the running gear are minimized. For this reason buses are commonly equipped with giant pneumatics to gain easy riding over the usual rough roads. This necessity

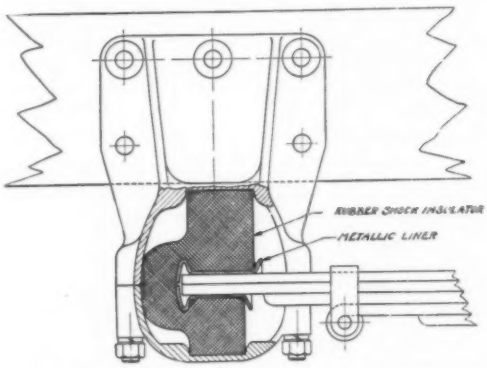


FIG 1. RUBBER SHOCK INSULATOR INCASED IN METAL BOX

seemed to indicate that solid tires are hopelessly outclassed for passenger service, regardless of their greater economy in first cost, better mileage and freedom from disabling accidents. Such, however, is evidently not the case, owing to a recently invented rubber shock-absorber which has been under test and development for the past two years.

SHACKLE SPRING SUSPENSION

The usual method for carrying the "sprung" load on an automobile bus chassis is to connect the frame to the springs by means of a metal shackle. This method fails to eliminate vibration to the extent desired, and the first solution for easy riding led to adopting the pneumatic tire for buses and trucks. The elimination of the pneumatic tire without loss of easy riding quality and a large decrease in the cost of bus operation was accomplished by interposing a rubber block or shock insulator to carry the sprung load on the steel spring.

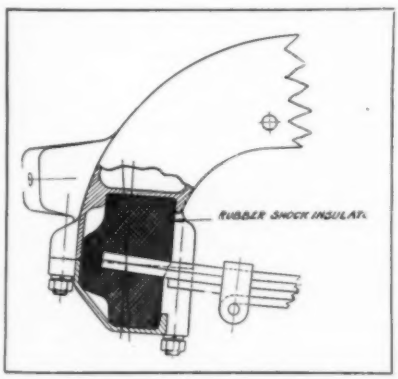


FIG. 2. RUBBER SHOCK INSULATOR APPLIED TO FRONT SPRINGS

RUBBER SHOCK INSULATOR

The form of the rubber shock insulator is indicated in Fig. 1, where it is shown in place in a metal box attached to the frame of the chassis and supporting the front ends of two leaves of the rear steel spring. These ends are encased in a metal liner for protection of the rubber. Fig. 2 illustrates the rubber shock insulator applied to the front springs. In this case the metal liners are not needed because these have much less motion than the rear springs. Fig. 3 is a view of the rubber spring hanger as applied at the rear axle of a bus and shows the close construction permitted by its use.

The density of the rubber employed is essentially that used in a solid tire. When in service under a 6½-ton load the rubbers are under a compression of about 180 pounds per square inch. The ends of the springs are so supported in the rubber that the springs can deflect as well as take the thrust in the usual manner. Fig. 4 is a view of the rubber spring blocks as molded; the left one is a rear and the right one a front block for a 2½-ton truck.

VIBRATION TESTS

Exhaustive series of tests under a variety of load, speed and road conditions, have demonstrated by means of a seismograph, the remarkable efficiency of the insulators in dampening vibration and producing easy riding on solid tires of the high crown and cushion types.

SEISMOGRAPH

The seismograph used in studying the dampening effect of the rubber shock insulators was of special design shown in Fig. 5. Its construction is as follows:

Mounted in a rigid steel frame is a metal drum onto which

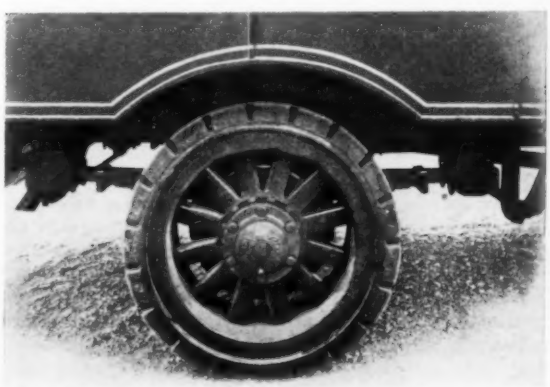


FIG 3. RUBBER SPRING HANGER APPLIED TO REAR AXLE

is wound the record paper from a spool at the opposite end of the frame. The axis of the drum is vertical and is driven through worm gearing; the worm shaft being driven from the front wheel by a flexible shaft. The worm gearing is arranged to give either of two reductions—1024 to 1 or 32 to 1. The drum makes one revolution per mile or one revolution each 165 feet, depending on which ratio is used. On the upper edge of the drum are ten cams, equally spaced, which trip a pencil holder and record distances of 1/10-mile or 1/320-mile, depending on the ratio used. A phonograph motor governed to record seconds is mounted near the recording drum and trips a pencil which marks periods of time near the bottom of the record.

REAR BLOCK FRONT BLOCK

FIG. 4. RUBBER SPRING BLOCKS FOR 2½-TON TRUCK

The seismograph pencil is held on a light arm pivoted on single-point bearings and provided with an aluminum leaf spring to hold the pencil against the record paper. The pencil arm is

[1] Data and illustrations supplied by C. Saurer, of the International Motor Co., New York, N. Y.

horizontal, and is tangential to the drum, the recording pencil touching the paper at the point of tangency. On the opposite end of the pencil arm is a weight which slides vertically on a central post. This weight is actuated by the vertical movement of the chassis on which the instrument is placed. The weight is supported by a coil spring below and a lighter spring above prevents excessive rebound. The movement of the weight is further dampened by an air dash-pot with adjustable valves, so that the damping effect may be accurately regulated. As the weight moves up and down from chassis vibration, the pencil leaves a series of arcs on the record paper, the length of these arcs varying with the movement of the weight.

A stationary pencil mounted on the frame leaves a horizontal line midway between the top and bottom of the paper. This line is coincident with the seismograph pencil when the truck is at rest, and is used as a base line or guide from which to measure the length of marks made by the seismograph.

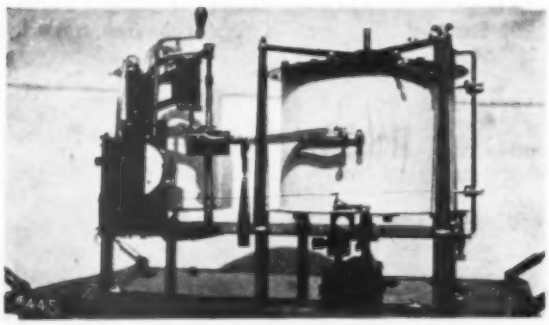


FIG. 5. SEISMOGRAPH FOR RECORDING DAMPENING EFFECT OF RUBBER SHOCK INSULATORS

The entire mechanism is enclosed in a glass case with sliding doors in both top and sides. The base of the instrument is provided with legs which may be screwed to the floor of the truck or car in any location desired, the length of the flexible driving shaft varying with location. A lever below the glass case throws the gearing out of mesh so that the record may be stopped or started at will, regardless of the movement of the vehicle.

Two charts are shown, Figs. 6 and 7, giving the record of vibrations under the same conditions of load, speed, road surface and obstacles encountered. All points on each curve correspond. It is plainly evident how much more rapid is the dampening effect

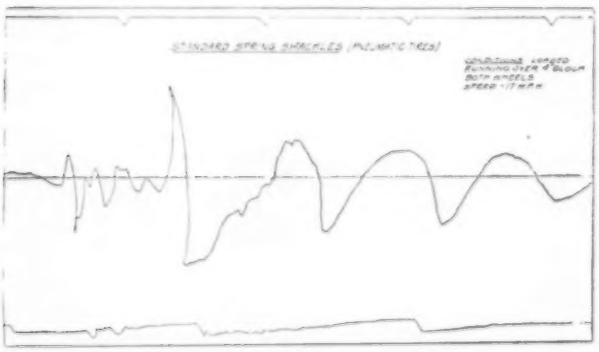


FIG. 6. SEISMOGRAPH RECORD OF VIBRATIONS OF STANDARD SPRING SHACKLES AND PNEUMATIC TIRES

given by the rubber shock insulation and solid tires than that by standard spring shackles and pneumatic tires.

HEAT TESTS

Comparative temperature tests on rear springs between standard springs and springs equipped with rubber shock insulators

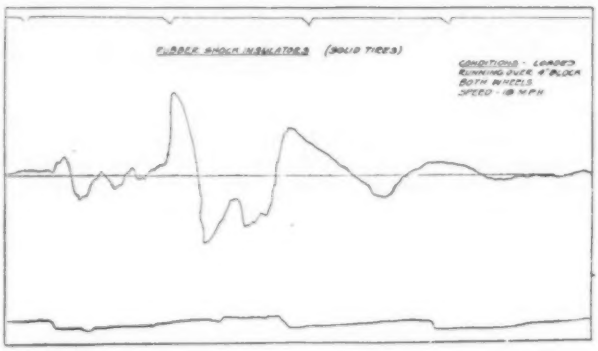


FIG. 7. SEISMOGRAPH RECORD OF VIBRATIONS OF RUBBER SHOCK INSULATORS AND SOLID TIRES

are shown in the following tables. Each line of figures represents the degrees F. observed on a separate continuous trip.

TABLE A. RUBBER SHOCK INSULATORS

					Front Spring		Rear Spring		
Air	Street	Front Tires	Rear Tires	Rubber Blocks	Front End	Rear End	Front End	Center	Rear End
74	83	93	94	72	67	67	82	75	82
74	83	93	94	72	67	67	86	78	86
79	89	110	112	78	77	77	92	88	93
88	98	126	126	81	80	80	98	90	98
68	72	90	90	..	62	62	74	69	74
68	72	90	90	..	62	62	76	71	76

TABLE B. STANDARD SPRING SHACKLES

				Front Spring		Rear Spring		
Air	Street	Front Tires	Rear Tires	Front End	Rear End	Front End	Center	Rear End
74	83	93	94	71	71	100	93	102
74	83	93	94	72	72	102	94	106
79	89	111	111	82	82	104	94	120
88	98	126	126	89	90	116	101	124
68	72	90	90	68	68	84	77	86
68	72	90	90	69	69	86	79	89

It is evident from the above tests that the use of rubber shock insulators eliminates sufficient deflection to reduce the heat in the rear springs from 10 to 20 degrees.

Many advantages might be named resulting from the use of the shock insulators, one of the most interesting being that they render a bus or truck on solid tires as easy riding, at least, as pneumatic tires.

TESTS TO DETERMINE DETERIORATION OF RUBBERIZED FABRICS

A meeting of great importance to the raincoat industry was held in New York City last January when rubberizers, cloth converters, and dyers interested in the manufacture of raincoats, attempted to arrive at an understanding regarding the use of certain dyes which tend to cause the deterioration of rubber. The tests then suggested and begun are now almost completed, and the results will soon be published. Fabrics treated with supposedly injurious chemicals will continue to be analyzed at stated intervals, normal atmospheric tests will be used, while the premature aging test, although not an exact science, can furnish much information of great value. The committee on specifications includes: E. Montalent, of H. A. Metz Co., representing dye stuff manufacturers; J. F. Warner, of the Bronx Co., representing finishers; Alfred L. Helwitz, of Alfred L. Helwitz & Co., representing converters; and Harold D. Mitchell, of the Vulcan Proofing Co., representing rubberizers.

MINTITE

Mintite is a patented finish for rubber surfaces. It consists of powdered mica of water-white color in a finely divided flexible condition. It is of light specific gravity and suitable for incorporation by mastication or for dusting the surface after vulcanization.

The application of the material does not require any special machinery and the advantages claimed from its use are important.

What the Rubber Chemists Are Doing

SOLS AND GELS OF VULCANIZED RUBBER[1]

GELS of vulcanized rubber are easily prepared by immersion in a suitable liquid; such gels cannot be dispersed within moderate ranges of temperature, however great the excess of solvent. If the temperature is high and the heating prolonged, complete dispersion may be obtained, but the caoutchouc is degraded, broken down, and decomposed. When recovered it is found to be soft and sticky and to have lost its useful properties.

The swelling of vulcanized rubber has been studied quantitatively both as regards the specific effect of different swelling agents and the condition, physical and chemical, of the vulcanized rubber. Broadly speaking, the higher the vulcanization coefficient, that is, the percentage of combined sulphur calculated on the amount of rubber used in the mixing, the less the swelling. With very low coefficients, such as one-half unit or less, dispersion of the rubber may take place on long immersion, but with medium coefficients, such as are technically employed in soft rubber goods—say, two or three units, no dispersion takes place in any chemically inactive solvent, however long the specimen be immersed.

With a view to the preparation of vulcanized rubber sols with medium coefficients attempts were made to vulcanize the rubber in the presence of the solvent—that is to say, the raw rubber was dispersed in a suitable solvent of a sufficiently high boiling point (xylene) with 10 per cent of its weight of sulphur, and the vessel was then heated in an oil bath, the contents being stirred from time to time.

After heating for an hour or so rubber began to deposit on the sides and bottom of the flask. The heating was continued for 2 or 3 hours and the more liquid portion, from the gel which had separated, poured off. The solvent was allowed to evaporate spontaneously and the two portions examined; the gel portion behaved like a fully vulcanized rubber and had a coefficient of about four units. The sol portion was weak and adhesive and contained only a little combined sulphur. Experiments with other solvents gave similar results. Vulcanization took place, but the greater part of the vulcanized rubber separated as a gel as soon as formed.

In order to obtain results with more volatile solvents, for example, benzene, a mixture of rubber and sulphur dispersed as above was heated in a closed vessel under pressure by placing in water in a digester so as to enable the necessary vulcanizing temperature to be reached. Under these conditions vulcanization proceeds as in an open vessel, but the vulcanized rubber does not separate. The product obtained is an apparently homogeneous but viscous sol, unless the concentration of the original raw rubber or the coefficient is too high, when the whole sets to a gel on cooling.

These sols and gels were found to have interesting properties. When first formed, the viscosity of the sols increases rapidly for the first few hours, and then only slowly if kept in the dark. All stages between a free-flowing but viscous sol and a stiff gel may be obtained according to the vulcanizing conditions and concentration. The change from sol to gel form may be brought about by a short exposure to diffused light. In many cases the gel so obtained when placed in the dark reverts to sol form, and this will again gel on exposure to light. This change from sol to gel and reversion may be repeated several times with the same specimen. The sols may be diluted by shaking with fresh solvent, but gels only with difficulty, and generally not at all.

When fresh from the vulcanizer and still warm a very viscous sol can be diluted to any extent. A gel which can no longer be dispersed may, however, swell when immersed in a fresh solvent. There is no sharp demarcation between the sol and gel. The sol gradually becomes more viscous and ceases to flow, the gel character then becomes more clearly defined, and the mass may be separated cleanly from the walls of the containing vessel. When the solvent is allowed to evaporate spontaneously a film or sheet of vulcanized rubber is obtained, which swells, but cannot be dispersed in fresh solvent.

The increase in viscosity and gelation of the sol first produced are hysteresis phenomena; they correspond to the changes in vulcanized rubber which occur on aging and are characterized by increasing stiffness, that is, greater resistance to stretching. The vulcanized rubber recovered from the sol is at first very soft and feels much undercured, but on aging it gradually stiffens. This change is promoted by exposure to light, and in this respect the behavior is parallel to the increase in viscosity and gelation noted with the freshly vulcanized sol. The effect of exposure to diffused daylight is illustrated by the load-elongation curves obtained with strips of rubber 0.5-mm. thick, 2 mm. wide, and 30 mm. long, in a Schwartz hysteresis machine. The effect of exposure to light on the load-elongation curves of films of rubber recovered from vulcanized benzene sols is shown in Fig. 1. The viscosity and tendency to gelation and properties of the

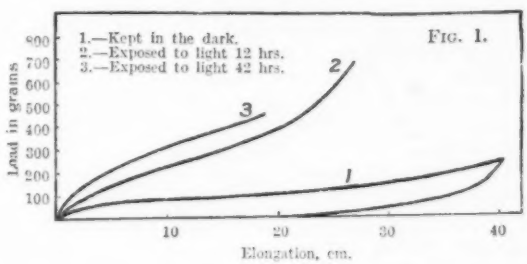


FIG. 1.

recovered rubber can to some extent be controlled by mechanical pretreatment of the rubber; a masticated rubber gives a less viscous sol which gels less readily for a given concentration and other like conditions than a sol prepared from unmasticated rubber.

The rate of combination of rubber in sol form with sulphur is influenced by the same factors which control the rate of combination in the dry way—that is, time and temperature of heating, proportion of sulphur and other ingredients, amount of accelerator, and specific character of the rubber used. There are also two new factors introduced—namely, the concentration of the rubber in the solvent and the specific character of the solvent. Details with quantitative experiments are given later.

Vulcanization in sol form can also be effected without sulphur, for example, by heating with trinitrobenzene in the presence of litharge. The products so obtained are inferior in physical properties to those produced by vulcanizing with sulphur, just as is the case when vulcanizing in the dry way.

Cold vulcanization with sulphur chloride or the little-used hydrogen persulphide[2] can be effected in sol form, and to this class of reactions belong the vulcanized rubber gels obtained by Peachey by mixing a raw rubber sol treated with sulphur dioxide with a further quantity of the solvent saturated with hydrogen sulphide. Within certain limits of concentration, proportion of vulcanizing ingredients, etc., there are obtained in a medium such as benzene, clear, transparent, pale yellow gels of the consistency of a 5 to 10 per cent gelatin gel.

[1] By Henry P. Stevens, Journal of the Society of Chemical Industry, August 31, 1921.

[2] Block, Berichte der Deutsche Chemische Gesellschaft, 1908, 41.

The formation of a rubber gel under these conditions was noted by Porritt[3] but remained an isolated observation. Some work has been done by Bernstein, Hinrichsen, and others on the reaction between sulphur chloride and rubber sols, but the object of these experiments was the preparation of a fully vulcanized rubber to investigate the constitution of the caoutchouc chlorosulphide, and for this purpose an excess of sulphur chloride was employed. This causes the more or less immediate separation of a dark-brown product, the object of investigation. Of earlier work mention may also be made of the process of vulcanizing rubber in sol form by exposure to ultra-violet rays.[4] The maximal coefficient of the vulcanized rubber so obtained is small, about one-half unit, as further exposure to the rays causes degradation or decomposition.

By restricting the proportion of sulphur chloride to rubber and working with a sufficient quantity of the medium, sols are obtained which do not gel on keeping. On increasing the proportion of sulphur chloride, and/or reducing the quantity of medium, sols are produced which gel in times varying from a few seconds to hours or days, as the case may be.

SYNERESIS OF VULCANIZED RUBBER GELS

The gels so obtained are not as a rule stable; the more easily gelation takes place the less stable the gel. Contraction may take place with the expulsion of a part of the medium. This change is promoted by exposure to light. A gel which will remain unchanged in a dark cupboard for months will commence to change in a few hours when exposed to diffused daylight. The syneresis is of two types. In the first a gradual shrinkage of the gel takes place, the liquor expelled containing little or no rubber. In the second the gel liquefies or is partly changed back into sol form and separation then begins as a deposit on the sides and bottom of the containing vessel. In this case the separation is incomplete. The former type occurs with gels prepared with relatively large quantities of sulphur chloride in the dark, but will also be initiated by exposure to light. The latter type occurs only on exposure to light and often with gels produced with quite small proportions of sulphur chloride. With gels produced by vulcanization with sulphur in the heat I have only observed syneresis of the first type, and that on exposure to light.

As in syneresis of the second type only partial separation takes place, the following figures may be quoted. The deposit is always more fully vulcanized, that is, contains a larger proportion of sulphur than the fluid part.

No. of Experiment	3a	12.
Rubber, grams	2.5	1
Sulphur chloride, c.c.	1.2	1.2
Benzene, c.c.	140	140
Sulphur, per cent:		
(1) In rubber from supernatant fluid	1.5	12.1
(2) In solid residue	11.1	29.0

EFFECT OF HEATING ON VISCOSITY OF RUBBER SOLS

The vulcanization of a dilute rubber sol does not bring about a great change in viscosity. Freshly prepared, one per cent vulcanized rubber sols have a viscosity similar to that of the raw rubber sols from which they are produced. This result was somewhat unexpected, as the vulcanization should cause a pectization of the rubber and consequently, an increase in viscosity of the sol.

The small change in viscosity may be attributed: (1) to the relatively small decrease in viscosity of the raw rubber sol on heating, corresponding to the reversion of vulcanized rubber when further heated in the dry way; (2) to hysteresis effects. Just as the rubber film obtained from the freshly vulcanized sol rapidly ages and becomes stiffer on keeping, especially after a short exposure to light, so the vulcanized sol tends to gel on keeping, and very rapidly in the light. I found that the effect of heating a masticated raw rubber sol was much less than would be expected. The following figures give the viscosity of a one per cent masticated rubber sol and a parallel series of raw rubber sols heated with and without sulphur:

Period of Heating, Hours	Viscosity (Benzene = 1) Without Sulphur	Viscosity (Benzene = 1) With Sulphur
Nil	2.22	....
½	1.57	1.10
1	1.57	1.54
1½	1.43	1.34
2	1.27	1.30
2½	1.25	1.36
3	1.20	1.13

It appears from these figures that there is at first a marked fall in viscosity in both cases, but with the raw rubber further small decreases take place with prolonged heating. In the presence of sulphur the initial fall in viscosity is much greater and is followed by a recovery, after which gradual decrease in viscosity takes place as with the raw rubber alone. The initial fall in viscosity in the presence of sulphur corresponds to similar observations made on the fall in viscosity produced by the addition of small quantities of sulphur chloride to a rubber sol. The subsequent fall is due to degradation of the rubber, and is more marked the lower the concentration of the solution.

The relative viscosity curves for vulcanized rubber sols resemble those obtained with raw rubber sols, as will be seen in

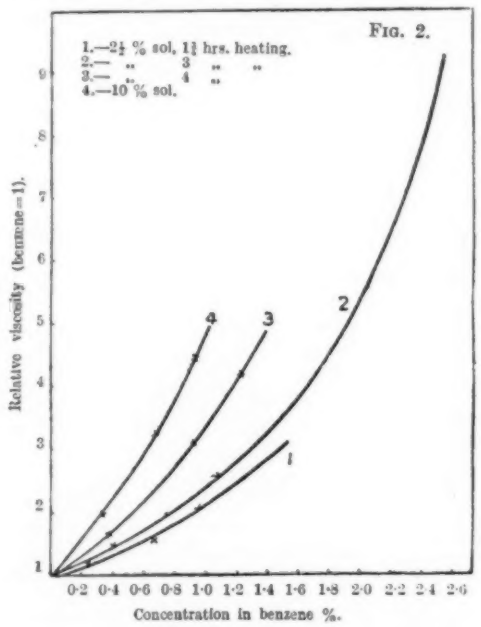


FIG. 2.

Fig. 2. Numbers 1 to 3 were vulcanized as 2½ per cent sols, and under these conditions viscosity increased with time of heating.

EFFECT OF PERIOD OF HEATING ON THE AMOUNT OF SULPHUR COMBINED

The mixture used consisted of 90 parts of crêpe rubber and ten parts of sulphur. Ten grams was dispersed in every 100 cc. of benzene and the mixture heated in sealed tubes from which the air had been exhausted, in an autoclave for half-hour periods up to 3 hours at 135 degrees C. The films obtained by spontaneous evaporation of the benzene were extracted with acetone and the combined sulphur estimated.

Period of Heating Hour	Total Combined Sulphur, Per Cent	Amount Combined Per Half Hour. Per Cent
½	0.83	0.83
1	1.49	0.74
1½	1.88	0.63
2	2.59	0.65
2½	3.14	0.63
3	3.56	0.59

The rate of combination shows a reduction with period of heating. This is probably attributable to gradual degradation of

[3] The Rubber Industry, 1914, 168.
[4] Heilbronner and Bernstein, The Rubber Industry, 1914, 156-171.

the rubber, small amounts of vulcanized rubber being removed by the prolonged acetone extraction, about 40 hours.

EFFECT OF CONCENTRATION ON THE RATE OF COMBINATION WITH SULPHUR

A mixture of rubber and sulphur similar to that employed in the previous experiment was treated with different proportions of benzene and heated in sealed tubes under the same conditions as before.

SLOW CURING RUBBER

Grams of rubber-sulphur compound per 100 cc. benzene	Combined sulphur Per cent
½	1.19
2½	1.24
10	2.04
25	2.36
50	3.98
75	4.55
Without benzene, vulcanized in steam	5.68

FAST CURING RUBBER

1	1.33
5	2.86
10	5.00*
20	5.69
25	5.95
30	6.31
40	7.29
50	8.00
60	8.39
80	8.90
No solvent (in vacuo)	9.19

* This figure is probably too high, owing to loss of solvent through cracking of tube.

These figures show that a 10 per cent sol vulcanizes about half as fast as the dry mix. With higher concentrations the amount of combined sulphur approaches asymptotically the figure for the dry mix. The maximal concentration of 80 gm. represents a concentration of about 50 per cent by weight and the amount of combined sulphur is only 0.3 less than for the 100 per cent, that is, the dry mix. See Fig. 3.

EFFECT OF NATURE OF SOLVENT ON RATE OF COMBINATION WITH SULPHUR

Raw rubber solvents have been classed in two groups, active and inactive. To the former belong such substances as benzene, ether, petroleum, and carbon bisulphide. The inactive solvents swell rubber to a slight degree only and an excess does not result in the diffusion of the gel. These include water, alcohol, acetone, and most esters. Rubber may be vulcanized on heating with sulphur in the presence of both types of solvent. Parallel tests with a number of active solvents with the usual rubber-sulphur 9 to 1 mix are given below:

Solvent	Combined sulphur, per cent
Benzene	2.29
Toluene	4.91
Xylene	4.74
Pseudocumene	3.88
Monochlorobenzene	3.38
Dichloroethylene	2.19
Trichloroethylene	2.17
Chloroform	2.85
Petroleum ether (b.p. 60°–80°)	2.61

The specific effect of the solvent is not very great. Toluene and xylene give higher figures than benzene, consequently the ordinary commercial naphtha gives a faster vulcanizing sol than benzene. In this connection it is interesting to note that water or steam appears to have little or no effect on the rate of combination of rubber and sulphur, as will be seen from the following figures: vulcanized in vacuo 8.99, in steam 8.97, in water 8.63.

VULCANIZATION IN THE COLD

The usual method adopted was to prepare a raw rubber sol by immersing 10 gm. of rubber for every 100 cc. of solvent, usually benzene. After swelling, the contents were mixed by inverting the bottle at intervals. Experiments were made with a crêpe rubber masticated to varying degrees on warm, differentially geared rollers. A 10 per cent sol of unmasticated rubber in benzene is very viscous, and takes several days to yield a mass of even appearance. A moderately masticated rubber disperses more readily, and was used for most of the experiments. The sulphur chloride was added as a 1 per cent by volume solution in the solvent, almost 2 per cent by weight in the case of benzene. After adding the measured amount the contents of the bottle were vigorously shaken and then put away in a dark cupboard.

With large proportions of sulphur chloride such as would be required to yield a product of the empirical formula C_5H_8SCl, gelation sets in very rapidly, and there is barely time to shake the contents of the bottle before the whole gels. With small proportions of sulphur chloride such as would be sufficient to produce technical vulcanization, say 1 or 2 per cent, the liquid slowly gels or may remain fluid according to the concentration of the sol. Thus 10 gm. of masticated rubber dissolved in 150 cc. of benzene and shaken with 25 cc. of a one per cent solution of sulphur chloride (by volume) began to gel in one to two hours.

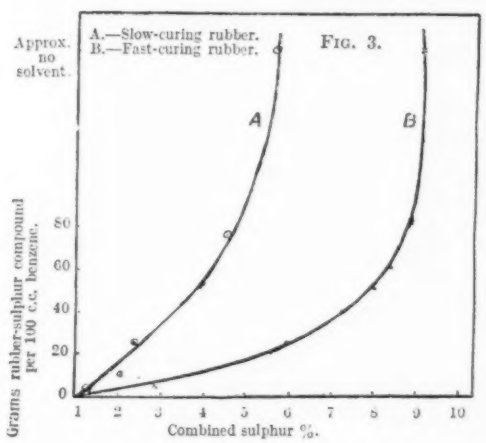


FIG. 3.

On halving the proportion of sulphur chloride and setting aside the viscosity increased, but the mass did not gel.

As examples of more highly vulcanized gels, 50 cc. of 10 per cent masticated rubber in benzene was treated with 60 cc. of a 10 per cent solution of sulphur chloride in benzene; the liquid immediately began to thicken and in a few minutes had gelled completely. The bottle was placed in a dark cupboard overnight, when an appreciable amount of syneresis of the first type set in, the gel shrinking to a dark brown mass retaining the shape of the bottle; the liquid expelled was of a bright yellow color.

Another experiment with rubber and sulphur chloride in the same proportions (50:60), but using rather more than twice the amount of benzene, 240 cc. as against 110 cc., resulted in a gel more gradually formed which showed no separation when left over night in a dark cupboard.

SUMMARY

Although vulcanized rubber swells, but does not dissolve in the ordinary rubber solvents, a vulcanized rubber sol can be obtained by heating a raw rubber sol with sulphur in a sealed vessel under pressure or by treating with sulphur chloride under controlled conditions. The sols on spontaneous evaporation yield films of vulcanized rubber which cannot be redissolved in rubber solvents.

Vulcanization in sol form is subject to the same influence as vulcanization in the dry state with the additional effect caused by degree of dilution and nature of the solvent.

Short exposure to light causes the sols to gel, and the effect is reversible when exposure ceases. Long exposure to light causes the gels to liquefy and gradually lose viscosity owing to degradation of the rubber. In the case of sols obtained with sulphur chloride, exposure to light may cause partial separation of the vulcanized rubber as a deposit.

RAPID VULCANIZATION[1]

Tetra-alkythiouram, disulphides, for instance, tetramethylthiouram disulphide,

$$N(CH_3)_2.CS.S.S.CS.N(CH_3)_2,$$

and cyclopentamethylenethiouram disulphide,

$$C_5M_{10}:N.CS.S.S.CS.N:C_5H_{10},$$

are able to effect rapid vulcanization of rubber without addition of free sulphur. The action is more energetic in presence of certain metallic oxides—that is, zinc oxide, a mixture of 100 parts of rubber, 5 of tetramethylthiouram disulphide, and 5 of zinc oxide undergoing vulcanization in 15 minutes at 145 degrees C. These disulphides are crystalline compounds and are obtained most readily by passing a current of chlorine through aqueous solutions of dithiocarbamates of imines, that is,

$$2N(CH_3)_2.CS.S.NH_2(CH_3)_2 + 2CI \longrightarrow N(CH_3)_2.CS.S.S.CS.N(CH_3)_2 + 2NH(CH_3)_2.HCl;$$

the imine hydrochloride may then be used for the preparation of fresh dithiocarbamate.

CHEMICAL PATENTS

THE UNITED STATES

COMPOSITION FOR WATERPROOFING AND STIFFENING TEXTILE material which comprises a combination of rubber, glue, starch, gum arabic, and rosin.—William C. Beyenburg, Passaic, New Jersey. United States patent No. 1,390,424.

PRESERVATIVE COMPOSITION FOR LEATHER, COMPRISING A VARNISH, a cellulose ester solution and a rubber solution.—Joseph Raoul Montpetit and James Scott Adamson, Ottawa, Ontario, Canada. United States patent No. 1,390,537.

THE DOMINION OF CANADA

INNER-TUBE PUNCTURE-REPAIRING COMPOSITION, CONSISTING of the following materials in any proportion; asbestos, plaster of paris, glue, alum and pure water.—G. W. Marshall, Vancouver, B. C., Canada. Canadian patent No. 213,026.

SULPHUR-TERPENE COMPOUND AND PROCESS. A SULPHUR compound, neutral, amorphous, non-colloidal, insoluble in water, soluble in toluol and xylol, and capable of reacting with rubber.—William Beach Pratt, Wellesley, Massachusetts. Canadian patent No. 213,157.

MANUFACTURE OF RUBBER. THE PROCESS OF PREPARING CLAY FOR the purpose of its being incorporated in rubber, consisting in first suspending the clay in water with the aid of a defloccuetor and then drying the clay while in the deflocculated state.—Philip Schidrowitz and Walter Plowman, both of London, England. Canadian patent No. 213,300.

THE UNITED KINGDOM

ORNAMENTING INDIA RUBBER. VULCANIZED RUBBER ARTICLES ARE dipped into any ordinary enamel solution used for decorating rubber goods, dried and the enamel vulcanized. The article is then immersed in naphtha which softens and expands the enamel causing it to rise from the article and producing the appearance of an irregularly woven surface.—C. E. Leheup, 156 Norman road, Leytonstone, London. British patent No. 165,200.

A DRESSING FOR BLACK LEATHER IS MADE BY DISSOLVING BEESWAX in asphalt heated not higher than the temperature of boiling water, then adding rubber cement, lampblack and Japan drier and mixing. When cold gasoline is added a thin varnish forms.—A. R. Caldwell, Whittier, California, British patent No. 165,302.

TREATING SCRAP, AIRPLANE AND LIKE FABRICS WITH ORGANIC solvents to remove and recover the ingredients of the dope or coatings.—J. D. Lumsden, R. W. R. McKenzie, E. H. Robinson, and M. Fort, all of Almondbank, Perthshire, British patent No. 165,604.

MIXTURE OF INGREDIENTS FOR USE AS A FILLER FOR CAOUTCHOUC and caoutchouc-like substances consisting of French chalk, China clay, iron oxide and magnesium carbonate with or without zinc oxide. The mixture may be calcined or bleached.—A. Nixon, Rusholine, Manchester. British patent No. 166,218.

BALATA CEMENT IN THE PROPORTIONS OF 15 OUNCES VENEZUElan balata, 20 ounces of Tumaca block balata, and 15 ounces of solvent naphtha, for the purpose of attaching soles and heels to the uppers of boots and shoes.—G. E. Haldinstein and F. Lee, both in Norwich. British patent No. 166,617.

ADHESIVE COMPOSITIONS, UNCOAGULATED LATEX, FRESH OR preserved, is mixed with a solution of glue, gelatine, casein, starch, dextrine, flour, gluten, etc., under such conditions that an adhesive composition results. Films made of the composition on hardening consist of almost pure glue on one side, and almost pure rubber on the other but the materials cannot be mechanically separated. Such films may be applied to leather, balloons, and surfaces generally to which rubber does not readily adhere.—Philip Schidrowitz, 57 Chancery Lane, London. British patent No. 166,731.

NEW ZEALAND

CAOUTCHOUC VULCANIZATION CONSISTING IN TREATING THE rubber, preferably in films, or in a dissolved or partially dissolved condition, alternately with sulphur dioxide and with hydrogen sulphide. The two gases diffuse into or dissolve in the rubber or its solution, and there interacting bring about a comparatively rapid vulcanization even at the ordinary atmospheric temperatures.—Stanley John Peachey, 5 Yew Tree Lane, Davenport, near Stockport, Cheshire, England. New Zealand patent No. 44,002.

LABORATORY APPARATUS

TRIANGLE FOR SUPPORTING CRUCIBLES

A CONVENIENT design for a triangle which is used universally for supporting crucibles during ignitions, is shown in the illustration. This is especially applicable since the advent

WIRE TRIANGLE AND ITS APPLICATION

of the Meker burner which replaced almost wholly the use of the Bunsen burner for ignitions and fusions. With this burner it is very easy to adjust, regulate and maintain the flame to almost any desired length.

The triangles are made of nichrome wire. The three twisted ends are bent at right angles to the triangle. One wire on each of the three ends is then drawn back to allow insertion of the remaining wire in the gauze of the burner.

This arrangement has been found extremely satisfactory for making ignitions, as it eliminates the large and clumsy ring stand. It is also adjustable as to height by merely bending or straightening the end wires.—G. E. Fisher in *The Chemist-Analyst.*

INSTANTANEOUS WATER HEATER

A most convenient electric water heater furnishes hot water promptly as needed, in home, office, laboratory or factory. In construction it is free from complications, and its operation is safe and economical. Hot water at any desired temperature may be obtained at any faucet connected with the apparatus. The cost of operation is slightly over that of gas, and special current rates are usually granted by the electric power companies.—The Aqua Electric Heater Co., 250 West 54th street, New York, N. Y.

[1] E. Romani, Giornale Chimica Industria Applicare, 1921, 3, 197-199.

New Goods and Specialties

ANOTHER TRADE-MARKED BLOWOUT PATCH

THE application of trade marks to blowout patches is something comparatively recent, and one of the newest patches is pictured here, with the carton in which it is packed.

The "Never-Creep" blowout patch is made of strong fabric, impregnated with rubber of high quality. It is flexible, easily adjusted, and fits snugly, conforming to the shape of the casing. The flaps are extra wide, with a feather-edge strip of rubber at both ends to prevent chafing the inner tube.—United States Tire Co., 1790 Broadway, New York, N. Y.

"NEVER-CREEP" BLOWOUT PATCH

NEW DEVELOPMENT OF FORCE-CUP PRINCIPLE

The "SaniDrain" flusher, to be used instead of the old-fashioned force-cup, depends on hydraulic pressure instead of suction for its power. The rubber nipple is attached to any tap or faucet, and is provided with a screw-lever for tightening to fit small-size faucets. The rubber hose is connected from the nipple to the bell which fits over the drain. The bell is provided with a wooden handle by which it is held firmly in place.

To operate the device, the water is turned on slowly at first, then increased to full pressure. It is claimed that the compound hydraulic pressure thus created will remove any obstruction.—Sanitary Drain Flusher Co., Oakland, California.

SANIDRAIN FLUSHER

DURABLE PAC WARDS OFF MOISTURE

The "Ace-Hi" pac, made of all white rubber by the steam-cure process, has been designed to protect the feet of workers in mines, creameries, ice houses, and other places where considerable water or moisture may exist and where strenuous service is demanded of footwear.

Knowing the tendency of all rubber footwear to oxidize or check after exposure for any length of time to strong sunlight, the manufacturer has developed a white compound for this and other items of its various lines, which has proved practically impervious to exposure and which, consequently, gives good service.


"ACE-HI" PAC

The bottom of the "Ace-Hi" pac has a white tire sole and a low heel. The gusset is equally waterproof and is adjusted by folding within the pac, under the lacing.

The "Ace-Hi" pac is made in N width only, with 6 eyelets for men and 5 eyelets for boys.—Converse Rubber Shoe Co., Malden, Massachusetts.

TO FACILITATE TIRE INFLATION

A new tire-pressure gage for pneumatic truck tires, known as the "Schrader Universal," is made with a bent foot so that when the mouth of the gage is placed over the mouth of the tire valve, the gage protrudes sidewise from the rim and is at right angles to the tire valve. This makes it possible to use the gage on all wheels, even when the spokes are close together. This gage has been found particularly convenient for use on wire and disk wheels.—A. Schrader's Son, Inc., 783 Atlantic avenue, Brooklyn, N. Y.

"SCHRADER UNIVERSAL" ANGLE-FOOT GAGE

"ROME SUPER SERVICE CORD"

The flexible cords attached to portable drills, paint sprayers, tire pumps, and other apparatus in garages and repair shops undergo strenuous wear. They are walked on and dragged across concrete floors, and they are more or less in contact with both oil and water. It is one of the chief requirements of their construction, therefore, that they shall be made with a durable covering that will withstand all these different wearing agents. "Rome Super Service Cord," two or three-conductor, has been made for just such usage, with the outer wall built like a cord tire, covered with tire-tread rubber and vulcanized under compression. It accordingly resists abrasion, oil, water, and acids. It also lies flat, does not kink or curl, and is strong enough, the manufacturer claims, to use as a tow line if necessary.—Rome Wire Co., Rome, N. Y.

NOISELESS STORE LADDER

Orderliness and quiet are definite assets of any shop or store which serves the public, and in order to provide quiet means for getting at merchandise on high shelves, the manufacturer of the "Bicycle" step ladder has equipped some of its models with rubber wheels. The illustration pictures the bent-base ladder which is so constructed as to permit it to be used with shelving having protruding drawers or a counter at the bottom. This ladder runs on a small floor track but another model runs on the shelf instead.—The Bicycle Step Ladder Co., 6 West Randolph street, Chicago, Illinois.


"BICYCLE" STORE LADDER


"KANT-SLIP" CORD

CONTACT FULL WIDTH OF TREAD

The new "Kant-Slip" cord tire tread is composed of a narrow central strip bordered on each side by a line of small X-shaped projections. These are higher at the outside than at the inside, resulting in a practically flat road contact and positive grip for the entire width of the tread when the tire is fully inflated. The X-shaped projections have their inside points joined by thin connections which form a series of recesses to serve as vacuum cups.—Kelly-Springfield Tire Co., Seventh avenue at 57th street, New York, N. Y.

RUBBER SUCTION CUP REDUCES FAT

To reduce fat safely and easily, without dieting or drugging or extreme athletics, is the object of the Lawton fat reducer, shown in the accompanying illustration.

LAWTON FAT REDUCER

The reducer consists merely of a white rubber suction cup with a handle, about 3½ or 4 inches in diameter at the opening.

The method of use is simply to place the vacuum cup firmly on the part of the body which it is desired to reduce, and move the cup, while maintaining the vacuum, back and forth, up and down, and round and round in both directions. The device is withdrawn by pressing in the lower edge to break the vacuum and admit air. —Dr. Thomas Lawton, 120 West 70th street, New York, N. Y.

THE "KENDEX" INSOLE FOR RUBBER-SOLED FOOTWEAR

The "Kendex" insole, used by the leading manufacturers of rubber-soled footwear in both this country and Canada, is made of light-weight, flexible material that will not stain delicate footwear nor cause the burning and stinging of the feet sometimes attributed to wearing shoes with rubber soles. This insole can be vulcanized to rubber outsoles at a high degree of heat without checking or curling, and it is a non-conductor of heat, keeping the feet cool in summer and warm in winter.—Kenworthy Bros. Co., Stoughton, Massachusetts.

SHOE FOR BASKETBALL AND GYM

The opening of the college season and the establishment of regular practice in the large university gymnasium and the smaller gymnasiums in high schools and private schools stimulates athletics all over the country. Basketball is the favored sport and its devotees require appropriate costume and footwear. The latest development in the line of basketball and gym shoes is illustrated here in the "Hyscore."

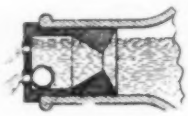
THE "HYSCORE" GYM SHOE

The upper of the shoe is of natural-colored duck, specially reinforced and trimmed with brown leather. The cushion sole is of black rubber, so designed that it will grip the floor and not slip, yet not cling to it when the foot is raised. It permits the utmost speed, but, at the same time, gives the wearer most complete surefootedness. The toe-cap is also of black rubber, and the foxing is double. There is a loose duck lining in this shoe and a "Kendex" insole. The "Hyscore" gym shoe is made extra strong to stand the strain of fast, hard play, and it comes in two styles—lace-to-toe and regular bal models, in sizes from 6 to 12.—Hood Rubber Products Co., Inc., Watertown, Massachusetts.

THE UNREFILLABLE BOTTLE AT LAST?

The granting of patents on various devices for making bottles non-refillable calls to mind the amount of effort, time, and money spent in trying to accomplish this object, which possibly nobody outside the patent office itself could hope to estimate.

The drawing here shows the inside construction of one of the newest of such stoppers, which is now being introduced. It consists of a hollow molded rubber stopper with aluminum top. This rubber stopper is cemented into the neck of the bottle and neither it nor the metal top can be removed without tearing the rubber. Two rubber lugs extend through the metal top, and these are cut off when the bottle is opened. In the hollow beneath the top is a free-moving steel ball which acts as a valve or stopper, preventing the evaporation of the contents of the bottle and also hindering its being refilled with anything. When the bottle is tipped for pouring, however, the ball moves away from the central neck opening and allows the contents to escape through one of the lug openings while air is admitted at the other, as indicated in the drawing.



RUBBER STOPPER, CROSS-SECTION

This closure is intended for such bottles as contain hair tonic, liquid shampoo, sauces, etc., and is made in three styles—as a shaker, dropper, or full-flowing. —United States patent No. 1,352,650. C. E. Blanchard, 3811 Cottage Grove avenue, Chicago, Illinois.

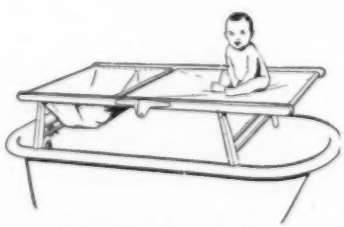
PNEUMATIC-TIRED VELOCIPEDE

The boy in knickers who formerly scorned the velocipede as "too babyish" is finding new delight today in owning one that has ball-bearing wheels and pneumatic tires with non-skid treads. He can pump up his own tires or get free air from the service station, and the velocipede itself is so good-looking that he is proud rather than ashamed to be seen riding it.—The American-National Co., Toledo, Ohio.

REAL PNEUMATICS

BABY'S COMBINED TUB AND DRESSING TABLE

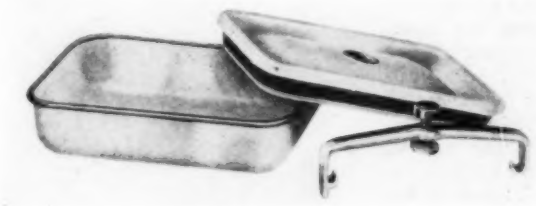
A folding bathtub, suitable for use in the care of a baby, is being widely advertised. This invention, combined with a small dressing-table, can be placed on top of any style of bathtub. The "Sani-Table-Tub" is waist-high, doing away with all bending over. It is quite safe, also, since it cannot be tipped over or knocked off. The baby's tub is made of heavy double-coated rubberized drill which conforms to the shape of the baby's body and keeps him upright, preventing him from slipping down under the water. The framework is finished in white enamel. The baby can be dressed and undressed on the small table adjoining, which forms part of the equipment. The "Sani-Table-Tub," light in weight, can be folded and hung up above the regular bathtub or behind a door when not in use. —William J. Jackson & Co., 608 Ford Building, Detroit, Michigan.



THE "SANI-TABLE-TUB"

ATTRACTIVE SANITARY FOOD CONTAINERS

An apparently sanitary receptacle for keeping various kinds of food both water-tight and odor-proof has been recently produced. The contents are kept hermetically sealed by a closely fitting cover with a rubber gasket, held down securely by an aluminum clamp. "Kelly-Kontainers" are made of carefully



THE "KELLY-KONTAINER"

selected steel upon which Benjamin porcelain enamel has been fused. They are lustrous white in color, will not stain or discolor, and are carefully inspected before shipping. These containers are made in ½-pint, pint, quart, and 1½-quart sizes, while a size for one quart is also furnished in Monel metal.—Benjamin Electric Manufacturing Co., 847 West Jackson Boulevard, Chicago, Illinois.

CONVENIENCES FOR THE CARE OF BABIES

Some models of the "Baby Bathinette," which combines a bathtub and dressing table, are decorative pieces of nursery furniture, while no less practical. The simpler style, with white or ivory enameled frame, can be set up in an ordinary bathtub. All models fold up compactly when not in use, the "De Luxe" resembling a small wardrobe.

"BATHINETTE DE LUXE"

The tub is made of soft white rubber, fitted with a hard rubber outlet faucet. The dressing table, which can be raised or lowered instantly to its position immediately over the tub, is of soft, comfortable white duck, with a patented safety strap for holding the baby on if necessary to leave him. The "Baby Bathinette" can be adjusted to two different heights, so that the mother or nurse can either stand or sit.—Kiddie-Town Products Inc., Seneca Falls, New York.

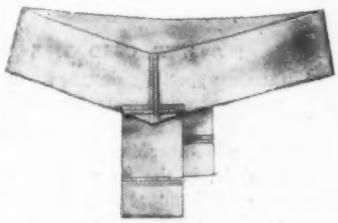
WASHABLE RUBBER GARMENTS

Useful articles of baby underwear are "Presto" baby pants and "Wearever" baby bloomers. These garments, made of pure gum rubber, have a special elastic reenforcement sealed inside of the shirring to prevent ripping at the waist and knees. This feature is patented. No cotton thread is used in the manufacture of any part of these goods, all the different parts being vulcanized together, thus making what is practically a one-piece garment. These rubber garments are easily washed, in clear or slightly soapy water.

"PRESTO" BABY PANTS

The manufacturer of these articles advertises others, including the "Presto" sanitary apron and "Presto" sanitary belt.

The "Presto" sanitary apron is made of good-quality rubber, with the top part of nainsook, and is bound all around as a finish. This apron is shaped to fit the body and is therefore more comfortable than some models. It is provided with tapes for adjustment.

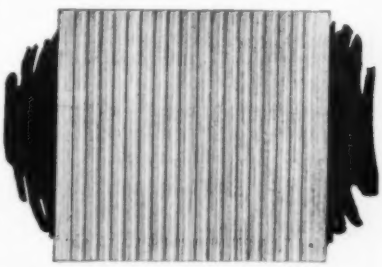


"PRESTO" SANITARY BELT

The "Presto" sanitary belt is made of good quality white rubber. It is perforated at regular intervals for ventilation and is reinforced at all the edges. It is shaped, but seamless, and is provided with suitable tabs. It is claimed that this belt stretches more than 200 per cent, thus being easily adjustable. It can be washed with warm soap suds.—Climax Rubber Co., 520 Broadway, New York, N. Y.

RUBBERIZED WOOD FOR BATTERY SEPARATORS

The new Gould storage batteries are similar to their predecessors except for the addition of a new type of separator. It is a well-known fact that battery acid eats into an unprotected wood separator and materially shortens its life. After experimenting with several materials the makers of the Gould batteries finally discovered a method of impregnating wood fibers with rubber. The result has been, it is claimed, that the life of wood separators has been lengthened without impairing the characteristic porosity and strength. The natural cellular qualities of the wood have, in the new process, been retained, while the armored rubber coating adds mechanical strength to the walls of the wood cells, in addition to protecting them against the acid.—Gould Storage Battery Co., 30 East 42nd street, New York, N. Y.



DREADNAUGHT ARMORED SEPARATORS

SWIMMING TUBE FOR WINTER BEACHES

Time was when swimming accessories were thought of only in connection with summer, but now that we have the habit of traveling over the country to find summer the year around, the swimming tube shown here will be practical wherever the climate favors water sports. It is made of good-quality green rubber, extra strong, and has a valve for inflation, protected by a band of rubber to keep the wearer from injury—The Falls Rubber Co., Cuyahoga Falls, Ohio.

"EVERGREEN" SWIMMING TUBE

New Machines and Appliances

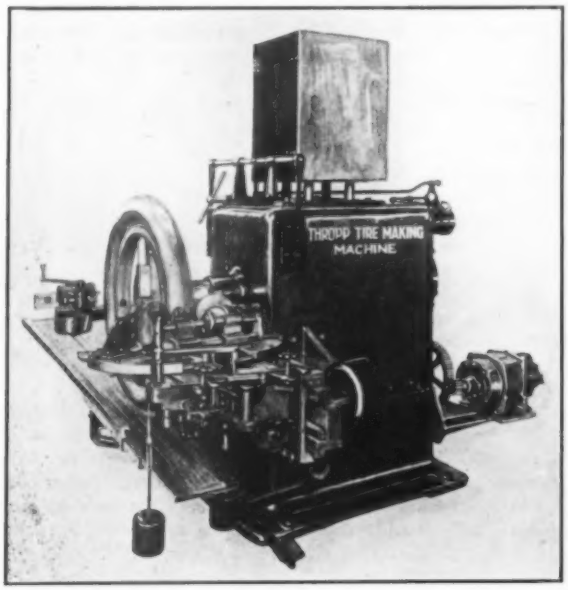
A NEW CORD TIRE MACHINE

A MACHINE specially designed to make up cord tires is shown in the accompanying illustration. It is electrically driven by a reversing motor with magnetic brake to give instantaneous stop in either direction.

Cord fabric, in the form of cross-plied endless bands, is first prepared on galvanized iron drums, the diameters of which are made to allow the requisite stretch when the bracelets are placed on the core on the building machine. Different sizes of tires require bands as follows: 3½-inch tires, two, of two plies each; 4-inch tires, two, of three plies each; 4½ and 5-inch tires, four, of two plies each.

The tire-building operations are as follows:

The first band is stretched over the core and both sides of the band are stitched down at the same time. In building a 3½ or 4-inch tire, the beads are next placed with the bead placing rings.



THROPP CORD TIRE BUILDING MACHINE

In building 4½ or 5-inch tires, two bands of two plies each are put on the core before placing the beads.

The beads come to the machine with the reinforcing or flapper strip attached. After placing the beads and rolling them down with the machine stitchers, a narrow liner is placed around the periphery on top of the first band and the next band stretched over. The liner is then removed and the band stitched down. When the required number of bands have been stitched into place, both sides of the tire are trimmed at the same time with the improved trimming device.

The cushion, breaker and tread are next applied in one operation. The tread is rolled by a special pair of rollers mounted on the machine. The tire is then removed from the machine to the finishing stand and the sidewall and chafing strip are applied by hand. —John E. Thropp's Sons Co., Trenton, New Jersey.

CIRCULAR MANDREL WITH NOVEL FEATURES

The illustration shows a new circular tube-curing mandrel that is made from a special analysis sheet metal said to be highly resistant to corrosion and is being successfully used by tire manufacturers.

A distinctive feature of this mandrel is that the name, trade mark, size number, or such other marking as the tube manufacturer may require, is branded into the metal, thus obviating the use of the separate transfer. As this brand is but one ten-thousandth of an inch deep, it does not detract from the very highly polished surface of the metal.

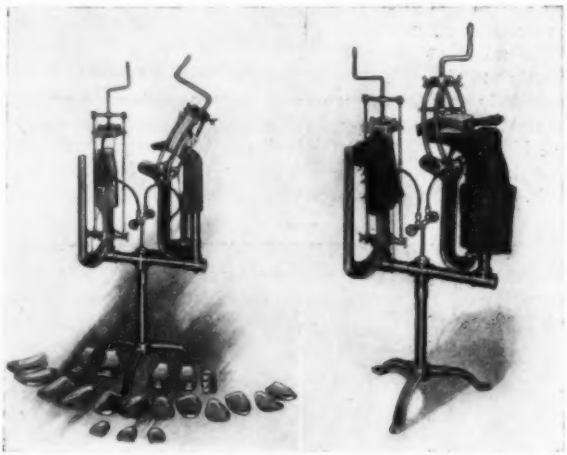
CIRCULAR INNER-TUBE MANDREL

This art printing is very attractive and constitutes an innovation in the marking of inner tubes. The Lowe company specializes in the making of mandrels for giant tire sizes.—Clyde E. Lowe Co., 606 Hippodrome Building, Cleveland, Ohio.

FOOTWEAR REPAIR VULCANIZER

The latest perfected equipment for vulcanizing repairs on rubber boots and shoes is shown in the accompanying illustrations. On the left appears the machine arranged to apply upward pressure by a band against a vamp, and the assortment of sole and heel form plates used in patching and vulcanizing. The illustration on the right shows how heat and pressure are applied in vulcanizing both heel and sole repairs.

Steam connection is made through the stand of the apparatus supplying heat through the last to the innersole. Heat for sole and heel pressure plates is supplied by flexible hose which connect with the steam supply at the center of the stand. Pressure for contact of the repair parts is exerted by hand-operated screws working against the steam-heated pressure plates.



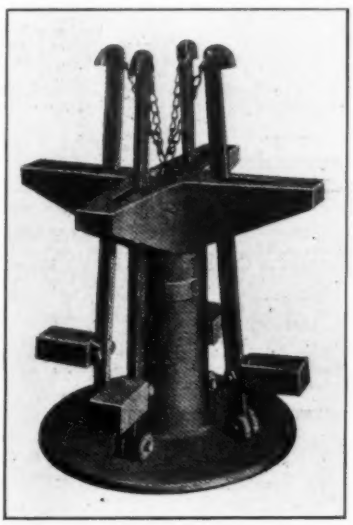
PATCHING DEVICE APPLYING SOLES AND HEELS

ARTHUR FOOTWEAR REPAIR VULCANIZER

By reversing the pressure screw, a patch overlaid by a piece of tin or sheet lead may be tightly drawn against the boot at any desired angle, forward, backward or circumferentially. In patching, the cure is effected entirely by heat derived from the steam-heated last on the inside of the boot.—Arthur Vulcanizing Equipment Co., Akron, Ohio.

TIRE RIMMING PRESS

One of the new types of equipment required in the manufacture of cord tires is the rimming press used for the purpose of placing the curing rings previous to inflating the air bag in the carcass.

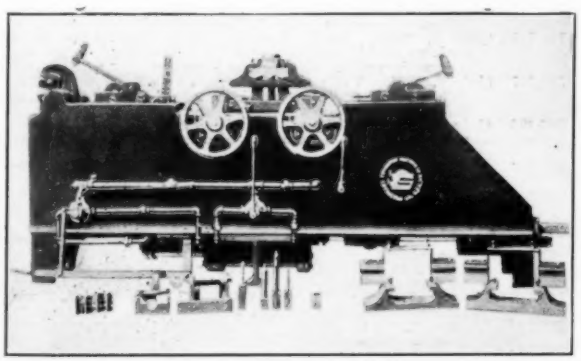


CORD TIRE RIMMING PRESS

The press shown in the illustration is a patented design specially commending itself to those needing this class of equipment, as there is no rigid head. The pressure is applied by means of the comparatively small but amply strong rods at the exact place required, leaving a clear space at a proper height for bolting the curing rings. The operation is simple and the press adjusts itself automatically to any standard size tire.—The Adamson Machine Co., Akron, Ohio.

MACHINE FOR ASSEMBLING AND DISMANTLING RAILWAY HOSE

Assembling and dismantling air-brake, signal and steam hose for railway use requires careful work to insure tight connections



RAILWAY HOSE-DISMANTLING AND ASSEMBLING MACHINE

and undamaged nipples and couplings. The ideas of several practical railroad men have been developed in the machine shown in the illustration.

With this machine, nipples, couplings and clamps are stripped from old hose and assembled on new, the same fittings being used repeatedly and the only loss being the bolts holding the clamps, which are cut in the first operation of dismantling.

The clamp bolts are first cut by a special shear knife and without injury to the hose clamps. The nipple end of the hose is placed over a nipple puller and the heads are brought toward the center by a lever. The coupling end of the hose is then dropped into the coupling puller and both clamp pullers are dropped down over the hose which is clamped in position by the clamp cylinder. A lever is then operated admitting air to the bottom cylinder and thus pulling both fittings out of the old hose at same time, together with the clamps.

Special troughed jaws are placed on the clamp block and clamp head. New hose is laid into this trough and the blocks brought together by the clamp cylinder holding the hose straight and in line without any clamping which would possibly injure new hose. Hose clamps are placed in position on the hose, the coupling being held in same fixture used for dismantling. The nipple is placed on a centering fixture, sliding heads are brought together by moving the operating lever, forcing both fittings into the hose at the same time. Due to the centering devices for both hose and fittings no possible injury can be done to new hose. The heads are then released and the hose clamp brought together by means of a hand-wheel and special jaws. The clamp bolts are then put in place, completing the assembling operation.

The machine is self-contained and air-operated, needing no special foundation. It operates with 85 to 100 pounds air pressure and can be successfully and speedily worked by an operator of average ability.—Covington Machine Co., Inc., Covington, Virginia.

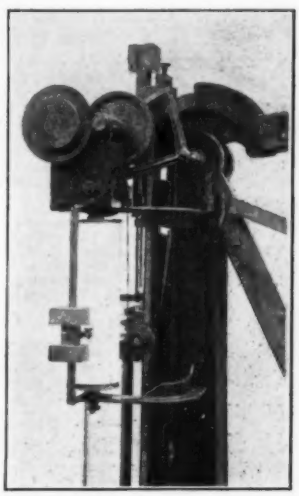
RUBBER TESTING MACHINE

The illustrations show a general view and the recording mechanism of the Avery machine for testing the tensile properties of rubber.

The machine is of the pendulum type. The strain is applied through a hydraulic cylinder bolted to the standard of the apparatus. The grips are of the drum type for ring specimens, although when required special grips are supplied for strip test pieces. The bottom drum is geared to a rack to allow the ring specimen to rotate when stretching.

AVERY RUBBER-TESTING MACHINE

When the load is applied through the top holder the pendulum is raised to full capacity of the machine, either 50 or 100 kilograms. A loose weight attached to the end of the pendulum is provided for the higher capacity. The scale is graduated for the 50-kilogram capacity, by divisions of 0.1-kilogram and for the 100-kilogram capacity, by divisions of 0.2-kilogram.—W. & T. Avery, Limited, Soho Foundry, Birmingham, England.



RECORDING MECHANISM, AVERY RUBBER-TESTING MACHINE

MACHINERY PATENTS

TIRE-VULCANIZING APPARATUS

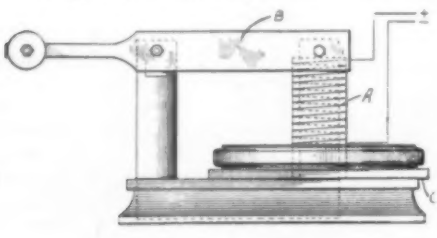
THE object of this invention is to provide an improved method of vulcanizing adapted for quantity production whereby distortion of the fabric can be avoided by precuring the inner parts of the tire or by expanding the tire before or during vulcanization; also to prevent blowing or swelling of the rubber during vulcanization. Two patents cover the invention, one for vertical and one for horizontal vulcanizers.

The principle involved is the inflation, under curing conditions, of the tire carcass on its core in the mold. The cores, molds and vulcanizer are so constructed and combined that under curing conditions the assembly constitutes a separate internal steam system adapted for applying fluid pressure to inflate or cure the tires from the side next the core, while on the outside of the molds an atmosphere of steam is maintained as in an ordinary press vulcanizer applying vulcanizing heat by conduction through the molds. —John R. Gammeter, Akron, Ohio, assignor to The B. F. Goodrich Co., New York, N. Y. United States patents Nos. 1,386,465 and 1,387,381.

REMOVING SOLID TIRES FROM RIMS

The method consists in heating the rim and a small portion of the attached hard rubber by heat applied electrically and sufficient to melt the rubber contact and allow the tire, cut at any point, to be easily stripped from the rim.

For applying the necessary heat a transformer is used, having a primary coil *A* at one end of a hinged and counter-weighted yoke *B*. On the transformer is located a platform *C* for supporting the solid tire. In this position the metal rim of the tire forms the secondary coil. The induced current rapidly supplies sufficient heat to melt the adjacent rubber and permit separation.—Robert R. Jones, assignor to the Firestone Tire & Rubber Co., both of Akron, Ohio, United States patent No. 1,385,079.



HARD BASE TIRE REMOVER

OTHER MACHINERY PATENTS

THE UNITED STATES

NO. 1,388,255 Tire press. W. E. Hardeman, Birmingham, Eng., assignor to Dunlop Tire & Rubber Corporation of America, Buffalo, N. Y.
1,388,382 Mold for pneumatic-tire tubes. F. A. Schwartz, Brooklyn, N. Y.
1,388,435 Apparatus and method for removing pneumatic tires from cores. K. B. Kilborn, assignor to The Goodyear Tire & Rubber Co. —both of Akron, O.
1,388,453 Apparatus for eliminating air, gas, and water contained in raw rubber freshly coagulated from the latex. S. C. Davidson, Belfast, Ireland.
1,388,902 Apparatus for applying cushion tires to rims. W. C. Stevens, Summit County, and C. W. Steele, Akron, assignors to the Firestone Tire & Rubber Co., Akron—both in Ohio.
1,389,219 Nipple machine. P. A. Raiche, assignor to Davol Rubber Co.—both of Providence, R. I.
1,389,283 Apparatus and method for making webbed gloves. A. K. Zawadski, Wrightstown, N. J. (See THE INDIA RUBBER WORLD, May 1, 1921, page 586.)
1,389,438 Collapsible tire-core and chuck. P. De Mattia, Clifton, N. J.
1,389,439 Collapsible tire-core. P. De Mattia, Clifton, N. J.
1,389,440 Collapsible tire-core. B. De Mattia, Clifton, N. J.
1,389,441 Collapsible tire-core. B. De Mattia, Clifton, N. J.
1,389,442 Apparatus for and process of making pneumatic tires. B. De Mattia, Clifton, N. J.
1,389,451 Shoe last. W. P. McLaughlin, assignor to National India Rubber Co.—both of Bristol, R. I.
1,389,599 Tire vulcanizer. A. J. Savage, San Diego, Calif.
1,389,821 Tire-repair vulcanizer. C. E. Everett, Milwaukee, Wis.
1,389,892 Collapsible tire-core. T. Midgley, Sr., Hampden, assignor to The Fisk Rubber Co., Chicopee Falls—both in Mass.
1,389,960 Apparatus and process for manufacturing tires. T. J. Mell, assignor to the Firestone Tire & Rubber Co.—both of Akron, O.
1,390,005 Apparatus and method for vulcanizing. J. C. Young, Washington, D. C.
1,390,058 Tire mold. V. A. Parker, Akron, O., assignor to The B. F. Goodrich Co., New York, N. Y.
1,390,302 Air-bag mandrel. H. F. Maranville, assignor to The Miller Rubber Co.—both of Akron, O.
1,390,303 Air bag for pneumatic-tire manufacture. H. F. Maranville, assignor to The Miller Rubber Co.—both of Akron, O.
1,390,478 Rubber-shoe repair vulcanizing outfit. J. M. Arthur, New Woodstock, N. Y., assignor of ½ to J. W. Arthur, Akron, O.
1,390,599 Rubber cracker. D. R. Bowen, assignor to Farrel Foundry & Machine Co.—both of Ansonia, Conn.
1,391,209 Device for repairing inner tubes. W. J. Raley, Milwaukee, Wis.
1,391,374 Tire-pressure device and gage for vulcanizing molds. C. and B. G. Duncan, Minneapolis, Minn.

THE DOMINION OF CANADA

212,876 Apparatus for solutionizing tire beads. The Dunlop Tire & Rubber Goods Co., Limited, assignee of T. A. Burns and D. J. Huether, coinventors—all of Toronto, Ont.
212,989 Apparatus for cutting and weighing strips of plastic composition for manufacture into tire treads. The Canadian Consolidated Rubber Co., Limited, Montreal, Que., assignee of R. Holmes and A. O. Abbott, Jr., both of Detroit, Mich., U. S. A.
213,392 Inner-tube vulcanizer. E. D. Hostler, assignor, I. J. Hamiel and C. H. Mather, assignee of ½ interest—all of Tipton, Ia., U. S. A.

THE UNITED KINGDOM

165,879 Apparatus for molding artificial dentures of vulcanite, etc. C. Joannides, 36 Place de l'Ambassade d'Angleterre, Constantinople.
166,540 Apparatus for splicing inner tubes. E. Fetter, Fifth street, Highlandtown, Baltimore, Md., U. S. A. (Not yet accepted.)
166,618 Golf-ball mold. J. Boneham, 26 Church street, Mansfield, Nottinghamshire.

GERMANY

342,579 (August 16, 1919) Tool for putting on and taking off pneumatic tires. Ernest Vaughan, Worcester, England; represented by R. Geissler, Berlin, S. W. 11.

DESIGN PATENTS ISSUED, WITH DATES OF ISSUE

786,824 (July 20, 1920) Vulcanizing apparatus for tire blocks. The Dunlop Rubber Co., Limited, London; represented by R. H. Korn, Berlin, S. W. 11.
787,330 (June 3, 1921) Belting coupling. Franz Neuser, Höchst-on-the-Main-Sindlingen.
787,387 (July 18, 1921) Die and stamp apparatus for automobile tires, leather and rubber goods, with exchangeable die and stamp types. Christian Heinrich Hansel, Giessen.
787,397 (July 21, 1921) Removable, self-adjusting framing tool for vulcanizing molds used in apparatus for pneumatic repairs. G. Rochow Komm-Ges., Offenbach-on-the-Main.
787,398 (July 22, 1921) Apparatus for framing glass molds for the rubber industry. Carl Braun, Stöckigt i. V.
788,149 (June 27, 1921) Vulcanizing apparatus. Feldmann-Werke, Soest, Westphalia.
788,296 (April 18, 1921) Apparatus for receiving a heating body for hand presses for vulcanizing defective rubber tubes. Arnold Max Brée, Sudwestkorso 15, Berlin-Friedenau.
788,314 (June 30, 1921) Adjustable rubber tire fastening for wheel felloes. Alexander Giegold, Crimmitschau.
788,326 (July 9, 1921) Easily movable joining contrivance for vulcanizing molds and the like in vulcanizing apparatus for pneumatic repair. G. Rochow Komm.-Ges., Offenbach a. M.
788,327 (July 9, 1921) Table plate for vulcanizing apparatus of U-iron with welded, arched steam jacket. G. Rochow Komm.-Ges., Offenbach-on-the-Main.
788,495 (July 21, 1921) Internal vulcanizing collar for pneumatic tire tread repairs. G. Rochow, Komm.-Ges., Offenbach-on-the-Main.
788,705 (July 7, 1920) Vulcanizing apparatus for single tires. Anton Marschall, Gutleutstrasse 96, Frankfort-on-the-Main.
788,909 (July 18, 1921) Vulcanizing apparatus. Edouard Rorbert Harris, Neuilly-sur-Seine, France; represented by Dr. C. Landeskroener, Dresden.
789,145 (July 1, 1921) Comb cutting machine. Fa. Fritz Claussner, Nuremberg.
789,245 (July 12, 1921) Socket joint for rotating soft rubber bodies used in dentistry. Carl Paul Schultz, Holzstrasse 5, Munich.
789,454 (August 27, 1920) Washer. Friedrich Gustav Köhler, Kranachstrasse 1, Leipzig-Lindenau.
789,595 (August 9, 1921) Fixing hose to nipple by means of conical screws. Johann Stolp, Luisenufer 20, Berlin.
789,864 (February 7, 1920) Apparatus for making tubes for pneumatic tires. The Dunlop Rubber Co., Limited, London; represented by R. H. Korn, Berlin, S. W. 11.

PROCESS PATENTS

THE UNITED STATES

NO. 1,388,747 Building cord tires. C. F. Ofensend, assignor to The Miller Rubber Co.—both of Akron, O.
1,388,762 Manufacture of rubber bathing caps. R. E. Riley, assignor to The Miller Rubber Co.—both of Akron, O.
1,389,221 Manufacturing vehicle tires. A. J. Roussey, Fort Wayne, Ind.

GERMANY

PATENTS ISSUED, WITH DATES OF ISSUE

342,098 (May 9, 1913) Making chemical apparatus or parts thereof proof against chlorine, acids and alkalis by making these of hard rubber or by clothing them with hard rubber. Allgemeine Elektricitäts-Gesellschaft, Berlin.

Reclaimed Rubber a Necessity

THE reclaiming of rubber was first conceived in the days of high-priced crude, and its cheapness in price was the first recommendation for its use. Those pioneer manufacturers who disregarded the prejudices of the trade and put it into their compounds ahead of their competitors, won a tremendous advantage in lowering their costs. And this was accomplished when the uniformity and dependability of the reclaimed product was not what it is today.

If the reclaimed rubber of today had no other arguments in its favor than it had in the early days, it would be a dead issue and consigned to the scrap heap by the advent of 15-cent crude rubber. The old price argument has been practically eliminated. Fifty years of reclaiming has brought such improvements in the stocks that they could not be replaced by crude rubber, regardless of price, and give the same advantages in wearing and aging qualities, high output, and low cost of handling in the mill.

SOURCES OF RECLAIMED RUBBER

The principal grades of reclaimed rubber are now made from automobile tires, rubber shoes, hose, solid tires, and inner tubes. Discarded worn-out rubber footwear makes an excellent material for reclaiming owing to its uniformity, non-creeping qualities, age of the scrap, and low sulphur content—the larger percentage of scrap shoes are an air-cure product.

THE ACID PROCESS OF RECLAIMING RUBBER

Shoes are sorted out and fed into a cracker which cracks them up into pieces of irregular shape. The difference between a cracker and an ordinary mixing mill is that the face roll is grooved. The material is then conveyed over magnets to extract metal, such as eyelets, overshoe buckles, etc., and sifted to remove some of the dirt which comprises a disadvantageous percentage of shoe scrap. The scrap is then placed in lead tanks and given a bath of sulphuric acid from 2 to 3 hours. This eats away and disintegrates the fabric without injuring the rubber which is then subjected to a thorough washing and run through mills to squeeze out the water. Before devulcanizing it is ground to a fine powder, riffled, and mixed with devulcanizing agents.

The devulcanizing process is accomplished in horizontal containers similar to tube vulcanizers, the material being placed in huge mixing pans. The process takes between 24 and 30 hours of exposure to live steam at about 280 degrees F. The next step consists of drying the material which has become soft and mushy. The rubber will then sheet out on refiners—mills geared to run at high speed and with their rolls set tightly together to enable them to compress any lumps in the stock. The operator frequently inspects the stock for lumps which gradually work out to the ends of the roll. The mills are equipped with a horizontal bar which allows the stock to roll up into tubular form in which the product of many reclaimers is sent to the trade.

As the rolls of stock are removed from the refining roll, the ends which contain the lumps and foreign matter, if any be present, are clipped off and sent through the refining process again. In this manner the greatest yield is obtained from the batch with the minimum of waste. Some grades are finished by running through a strainer, similar to a tubing machine equipped with a fine-mesh wire screen which removes any foreign matter which may have worked through the previous processes. Thus uniformity in the stocks is made a certainty. Slabbing out on a mill and drying the finished product complete the cycle, and the reclaimed rubber is placed in bags or barrels to be shipped.

THE ALKALI PROCESS OF RECLAIMING RUBBER

The alkali process differs from the process outlined above in that the ground scrap is placed in a revolving drum containing caustic soda and connected with steam pressure. In this way the fiber is removed and the rubber devulcanized at the same time. Reclaiming uncured tire friction has become more a part of the business in recent years, owing to the large quantity of this scrap which the tire industry has thrown on the market. Many tire manufacturers have it reclaimed expressly for their own use, while others sell it outright, and it appears on the market as a semi-floating reclaimed stock adapted for use in mechanical and other products. This process requires unusual care in the reclaiming mill to ascertain that all of the cotton has been removed. Discarded automobile tires are made into reclaimed rubber in practically the same manner as rubber shoes, the beads being removed before processing begins. A tire stock is harder to turn out, owing to its toughness and greater sulphur content.

ADVANTAGES OF RECLAIM OVER CRUDE RUBBER

The biggest advantage of reclaimed rubber over crude is the ease with which it can be handled at the mill. Crude rubber comes in wooden crates, the plantation product being compressed in square blocks. The sheets must first be pulled apart and the rubber inspected for wood and other foreign materials. Before it can be compounded the rubber must first be broken down. This process, which is the milling that reclaimed rubber has already undergone, first when it was crude and secondly during the process of reclaiming, requires from 20 minutes to several hours on a mill, depending upon the condition of the sheet. The rubber is then cut from the mill and aged 24 hours before it is ready for mixing. In the mixing process the rubber is again milled from 5 to 10 minutes before the fillers are added. It is here in the process that reclaimed rubber begins. As the ideal plasticator it can be added to the compound on the mixing mill, without going through any of the preliminary and expensive processes that crude must undergo to become workable.

RECLAIM IN RUBBER HEELS

Perhaps the best example of the advantage of this saving of overhead, labor, power, etc., can be seen in the rubber heel industry. This branch of the rubber trade, which is in a flourishing condition today, depends upon quantity production, as is evidenced by the report that one manufacturer is turning out 300,000 pairs a day. It is a fact that many of the heel manufacturers today are using automobile tire reclaim in conjunction with crude rubber as the base of their product: first, because of the low mixing cost; secondly, because of the time saved in the curing; and thirdly, because it makes a tougher, more resilient, and longer-lived heel. That the rubber heel product of 1921 is a quality article can be realized by the number of leather shoe manufacturers who are furnishing their best grades with rubber heels as original equipment. It is also a known fact that rubber heels have been made with a compound containing 47 per cent of a high-grade reclaimed stock. Oxidation is much slower in reclaimed products than in all crude rubber articles.

Some heel manufacturers do their own reclaiming, most of them using inner tubes, tread overflow rinds, or motor truck tires with plenty of oil to take up the compound. These make a reclaimed rubber that is fairly useful for cheap heels. High-grade heels, however, should contain a large amount of reclaimed automobile tires of which there are several standard grades on the market.

RECLAIM IN RUBBER FOOTWEAR

Another argument for compounds containing a percentage of reclaimed rubber along with crude is found in the rubber footwear industry. All outsoles for boots, gum shoes, tennis shoes, and arctics are embossed with trade-marks on a soling calender.

In running soling compounds containing from 40 to 50 per cent of crude rubber with no reclaim, it has been found that the sheets of stock after booking and aging shrink so badly that very often out of a sheet of soling containing six medallions, one or two perfect soles will be the best yield. If the stock is cut hot without aging, the soles will shrink out of shape before they can be applied to a shoe.

Since crude rubber has been so cheap many shoe manufacturers have experimented with pure gum soles but found them entirely impractical for the simple reason that crude rubber will not "stay put." The only remedy is the molded article, but this requires a long cure and is expensive to apply to the shoe. By far the greater part of footwear soling compounds, however, contain from 12 to 25 per cent reclaimed rubber mixed with 25 per cent crude as a base. Some cheaper compounds, especially in whites, when there is no reclaim on the market, owing to the scarcity of white automobile tires, contain 15 to 20 per cent crude rubber with no reclaim. These compounds offer no great difficulties in shrinkage but on the other hand they have very poor wearing and aging qualities.

The main difficulty with the steam-pressure cured boot is cracking of the uppers after exposure to light. Many chemists have improved their upper compound and overcome this difficulty by adding from 5 to 7 per cent reclaimed rubber.

RECLAIM IN AUTOMOBILE TIRES

Automobile tires are made of the best materials obtainable, on account of the terrific abuse to which they are subjected, and the price they sell for is sufficient to warrant using the best. Certainly with 15-cent rubber and 70-cent fabric there is no reason why a tire manufacturer should attempt to use anything but the best. Although it is not generally known, because to an outsider the term shoddy or reclaim means something inferior, 5 to 10 per cent of reclaim is used in the better wearing tire treads today. And there is no better testimony than this that reclaimed rubber imparts good wearing and aging qualities. No consideration of price recommends its use here; it is employed because it does the job better than anything else obtainable.

RECLAIM IN MECHANICAL RUBBER GOODS

In the field of mechanical rubber goods, where reclaimed rubber has been used for years, owing to its cheapness, some manufacturers are discarding it altogether and making hose, belting, etc., with crude rubber entirely as a base. The first disadvantage of this policy is the changing of the compounds, which is always a risky thing to do. It takes some time to ascertain how new compounds are going to act in actual service, despite laboratory tests. And by the time the new compounds have become stabilized crude rubber will probably be advanced enough in price to forbid its use in such large quantities. The advantage which reclaimed rubber possesses in the belting or hose compound is the longer life of the article.

DANGERS OF SUBSTITUTING CRUDE FOR RECLAIMED RUBBER

Reclaimed rubber is much more "fool-proof" than crude. This is especially true in mills turning out a large production. Often cheaper and better products can be obtained by substituting the present cheap crude rubber in old substantial reclaimed compounds with, of course, the necessary addition of powerful accelerators to make the cure possible in the customary time.

But there are two vital dangers connected with a change of this sort. In the first place, accelerator compounds do not age in the long run where they have been substituted for reclaim compounds. The accelerator in mill practice is not always used up in the cure and the finished article continues to cure in use or on the jobber's shelves. Secondly, the crude compound will work well while the expert sits on the job or runs the sample in the laboratory, but turn it loose in the factory to be manipulated by common labor, and it is very easily ruined. The rubber is milled too much or too little, the accelerator burns the compound, and a great lack of uniformity is evident in the finished product. These difficulties are not encountered in using a standard reclaim.

RECLAIM IN WIRE INSULATION

The resumption of building in all lines will undoubtedly cause increased activity in the insulated wire trade, which always has been a large user of reclaimed rubber. In this branch of the trade, reclaim has possessed the advantage of flowing more easily through the tubing machine, enabling the manufacturer to turn out more goods in less time and insuring a uniform product.

RECLAIM IN CARRIAGE CLOTH

Reclaimed rubber is a very necessary ingredient in the manufacture of carriage cloth and automobile topping. This class of goods cannot be run with all crude rubber compounds owing to creeping. Reclaim takes the embossing better, frictions and spreads more easily, and does not crack in the finished topping.

THE FUTURE OF RECLAIMED RUBBER

From this brief survey of the reclaimed rubber requirements of the industry, it can be seen that it is used in packing, matting, etc., where its cheapness and high production possibilities recommend it, as well as in automobile tires, footwear, and mechanical goods, where it is used on account of the better product obtained.

Cheap crude rubber has put the industry to the test, and how well it has met that trial is shown by the fact that new uses for reclaimed rubber have been developed during this period of severe competition. With the increase in price of crude rubber which is bound to come within a short time, those manufacturers who have temporarily abandoned the use of reclaim and those who are now using it to a greater advantage, will create a demand which will bring the junk dealer to our back doors offering 5 cents a pound for worn-out tires.

STATEMENT OF THE INDIA RUBBER WORLD

Statement of the ownership, management, etc., required by the Act of Congress of August 24, 1912, of THE INDIA RUBBER WORLD, published monthly at New York, N. Y., for October 1, 1921.

State of New York, } ss.:
County of New York, }

Before me, a notary public in and for the State and county aforesaid, personally appeared E. M. Hoag, who, having been duly sworn according to law, deposes and says that she is the business manager of THE INDIA RUBBER WORLD, and that the following is, to the best of her knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher, The India Rubber Publishing Co., 25 West Forty-fifth street, New York City.

Editor, Henry C. Pearson, 25 West Forty-fifth street, New York City.

Managing Editor, Henry C. Pearson, 25 West Forty-fifth street, New York City.

Business Manager, E. M. Hoag, 25 West Forty-fifth street, New York City.

2. That the owners are: (Give names and addresses of individual owners, or, if a corporation, give its name and the names and addresses of stockholders owning or holding 1 per cent or more of the total amount of stock.)

The India Rubber Publishing Co., 25 West Forty-fifth street, New York City.

Henry C. Pearson, 25 West Forty-fifth street, New York City.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustees or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by her.

E. M. HOAG, Business Manager.

Sworn to and subscribed before me this 30th day of September, 1921.
(Seal) THOMAS P. BURKE,
Notary Public, New York County.
(My commission expires March 30, 1923.)

News of the American Rubber Industry

THE RUBBER TRADE IN THE EAST AND SOUTH

By Our Regular Correspondent

NEW YORK

In New York and vicinity the rubber manufacturing activity in mechanical goods lines is responding to the improved conditions prevailing in general business. Factories are operating, on the average, at about 50 per cent capacity, with some at nearer two-thirds their normal output. Tire factories are producing on their winter schedules of one shift. Automobile topping manufacturers are not as active because of the seasonal drop in demand for their goods. In the proofing trade production varies from full capacity to rather dull, according to the lines of clothing involved. There is a distinct improvement in the demand for insulated wire, anticipating revival in the building trade. A diminished volume of orders is coming to the rubber shoe trade, attributable to anticipation on the part of dealers that there will be a reduction in shoe prices about January 1.

W. E. Byles, formerly at 142 Pearl street, announces the removal of his offices to 100 William street, New York, N. Y. Mr. Byles deals in crude rubber and other eastern produce.

H. A. Daggett Co., Montclair, New Jersey, dealer in crude rubber, has designated S. H. Sears, 68 Beaver street, New York, N. Y., its representative in New York State.

The firm of John D. Lewis & Co., manufacturer and importer of dyestuffs and chemicals, with offices at 2-6 Cliff street, New York, N. Y., reports that Walter H. Bass is now connected with the organization, in the crude rubber sales department.

E. I. du Pont de Nemours & Co., Wilmington, Delaware, has designated H. W. Pitman, Buffalo, New York, one of its new representatives in New York State.

Edward R. Duer has been appointed receiver for the Rubber Corporation of America, with executive offices at 240 West 55th street, New York, N. Y. It is believed that a reorganization of the corporation's affairs will occur at an early date.

At the plant of the Electric Hose & Rubber Co., Wilmington, Delaware, the wages of the workmen have been recently cut from 15 to 17 per cent. Salaried employes, who have been receiving a war bonus of 40 per cent have had this reduced 20 per cent. Officials of the company report that this is the first cut they have made on war-time wages. The company's officers are: George S. Capelle, president; Edmund Mitchell, vice-president; and C. D. Garretson, secretary, treasurer, and general manager.

L. K. Rittenhouse was recently made eastern manager for the Star Rubber Co., Inc., with offices at 226 West 52nd street, New York, N. Y. Previous to this Mr. Rittenhouse was the New Jersey manager of the Firestone Tire & Rubber Co. Still earlier connections were with the Diamond Rubber Co., as branch manager at Pittsburgh, Pennsylvania, in 1906, and as New England manager in 1911. After the consolidation of this company with the Goodrich organization, Mr. Rittenhouse was transferred to St. Louis as southwestern district manager.

The Ranger Rubber Co., Inc., Long Island City, N. Y. is the name recently given to the combined companies formerly known as the Akron Tire Co., New York, N. Y., and the Overland Tire Co., Newark, New Jersey. The company's products are reconstructed tires, puncture-proof reliners, and pneumatic rubber balls. The present officers are: J. D. Olwell, president; J. A. Whitman, secretary and general manager; and Burrill Ruskay, treasurer.

The Ground Gripper Shoes, with the rubber "Rotor" heel insert, have another new home at 29 West 46th street, New York, N. Y.

MADISON TIRE & RUBBER CO. REMOVES OFFICES TO BUFFALO

Desiring to concentrate the various departments of The Madison Tire & Rubber Co., its officials, on October 1, moved the general offices from 20 West 60th street, New York, N. Y., to the company's plant, at Spencer, Hannah, and Babcock streets, Buffalo, N. Y. Joseph M. Dine, general sales manager, has been made vice-president in charge of sales, and Frank H. Brewster, vice-president in charge of production. Other recent appointments, in connection with men associated with Madison interests, are: Charles B. Brewster, assistant treasurer, and Fred Griscom, chief engineer.

CONNECTICUT NOTES

In the September issue of THE INDIA RUBBER WORLD mention was made of the appointment of Augustine Lonergan as receiver for The Kelley Tire & Rubber Co., New Haven, Connecticut. According to recent press notices Mr. Lonergan, as receiver, has been removed, and the bankruptcy affairs are again in the hands of Albert H. Barclay, of New Haven, and the City National Bank, of Bridgeport, who were appointed by the Superior Court of New Haven County. It is claimed that the company is not insolvent and that a receiver in bankruptcy would interfere with the adjustment of the corporation's affairs.

A remarkable record for both production and sales, and especially encouraging at the present time, is that given by officials of the Norwalk Tire & Rubber Co., Norwalk, Connecticut. At this company's new building, which was completed last year, both production and sales of tires and tubes have surpassed, by 50 per cent, the peak production of 1920, while increase of business has warranted the recent opening of a warehouse in Boston. Officers of the company are: William B. Miller, president; David Spence, vice-president and general superintendent; F. L. Lamson, treasurer; and C. E. Mathewson, secretary and sales manager.

SOUTHERN NOTES

The work heretofore handled at the Kelly-Springfield Tire Co.'s plant at Wooster, Ohio,, will be carried on at the company's main plant at Cumberland, Maryland, developments at the latter factory having reached a stage which makes this measure advisable.

The Holtite Manufacturing Co., Inc., 919 East Baltimore street, Baltimore, Maryland, manufacturer of the "Jax" rubber heel, in order to increase production has equipped its factory with rubber heel machinery bought from The United Lace & Braid Manufacturing Co., Providence, Rhode Island. The Holtite company began business in March, 1919, with a capitalization of $110,000, which it found necessary to increase to $210,000 in January, 1920. The offices are: Morris Eisen, president; Harry Trager, vice-president; and Albert A. Esterson, secretary and treasurer.

DIVIDENDS DECLARED

COMPANIES	STOCK	RATE	PAYABLE	STOCK OF RECORD
General Electric Co	Com.	2% q.	Oct. 15	Sept. 9
Goodrich Co., The B. F	Pfd.	$1.75 sh.	Jan. 2	Dec. 22
Goodyear Textile Co	Pfd.	1¾% q.	Oct. 1	Sept. 15
Hodgman Rubber Co	Pfd.	$2.00 q.	Nov. 1	Oct. 15
Hood Rubber Co	Pfd.	$1.75 q.	Nov. 1	Oct. 20
Kelly-Springfield Tire Co	Com.	3% stk.	Nov. 1	Oct. 14
Kelly-Springfield Tire Co	8% pfd.	$2.00 q.	Nov. 15	Nov, 1
Lee Rubber & Tire Corporation	Com.	$0.50 q.	Dec. 1	Nov. 15
Monatiquot Rubber Works	Pfd.	1¼% q.	Oct. 1	Sept. 24
New Jersey Zinc Co., The	Com.	2% q.	Nov. 10	Oct. 31
Sewell Cushion Wheel Co	Pfd.	2% q.	Oct. 1	Sept. 25
United States Rubber Co	1st pfd.	2% q.	Oct. 31	Oct. 15
Victor Rubber Co	Pfd.	1¾%	Oct. 25	Oct. 15
Westinghouse Electric Manufacturing Co.	Com.	$1.00 q.	Oct. 31	Sept. 30
Westinghouse Electric Manufacturing Co.	Pfd.	$1.00 q.	Oct. 15	Sept. 30

EXPERT IN WIRE BUFFING WHEELS

RALPH W. WHEELER, vice-president of the North Eastern Manufacturing Co., New Haven, Connecticut, maker of Interlox wire buffing wheels, has had a wide experience in the rubber goods manufacturing and wire-brush making fields which well equip him as an expert in buffing wheels for the rubber industry.

RALPH W. WHEELER

Born in Wyocena, Wisconsin, May 2, 1884, he attended the graded schools of his native state and was graduated from the Glenville High School, Cleveland, Ohio, in 1902. That same year he entered the employ of the Lake Shore & Michigan Southern Railway as a clerk and continued as an accountant in the general auditor's office until 1910, when he went to the Diamond Rubber Co., Akron, Ohio, later consolidated with The B. F. Goodrich Co. He held the position of assistant sales manager of the pneumatic tire and accessory department until 1915, when he resigned to accept a position with the Osborn Manufacturing Co., Cleveland, Ohio, brush and broom maker. His advancement was steady from office manager, salesman and district manager to sales manager, from which position he resigned October 1, 1921.

Mr. Wheeler is also field manager of the Associated Bankers' Corporation. His clubs include the New York Sales Managers' Club, New York Hardware Club, and the Old Colony Club.

NEW YORK STOCK EXCHANGE QUOTATIONS

OCTOBER 20, 1921

	High	Low	Last
Ajax Rubber Co., Inc.	19⅝	19¼	19¼
Fisk Rubber Co., The	10¼	10	10
Goodrich Co., B. F., The	31⅝	31⅜	31⅜
Kelly-Springfield Tire Co.	40¼	39½	39½
Keystone T. & R. Co., Inc., The	10	10	10
Lee R. & T. Corporation	28⅜	27½	28
United States Rubber Co.	48⅞	48½	48¾
United States Rubber Co., 1st pfd.	89	89	89

AKRON RUBBER STOCK QUOTATIONS

The following are closing quotations of October 18, supplied by the App-Hillman Co., Second National Building, Akron, Ohio:

	Bid	Asked
American R. & T. Co., com.	30	40
Amazon Rubber Co., The	12	20
Firestone T. & R. Co., com.	57	60
Firestone T. & R. Co., 6% pfd.	82	85
Firestone T. & R. Co., 7% pfd.	72	73
General T. & R. Co., The, com.	185	210
General T. & R. Co., The, 7% pfd.	80	86
Goodrich, B. F., Co., The, com.	30	31¼
Goodrich, B. F., Co., The, pfd.	72	75
Goodrich, B. F., Co., The, 5-yr. 7% notes	94¼	95¼
Goodyear, T. & R., Co., The, com.	9¼	9⅝
Goodyear, T. & R., Co., The, 7% pfd.	22½	23
India T. & R. Co., com.	67	75
India T. & R. Co., 7% pfd.	..	70
Mason T. & R. Co., The, com.	8	9
Mason T. & R. Co., The, 7% pfd.	46	49
Marathon T. & R. Co., com.	2½	3½
Miller Rubber Co., The, com.	45	55
Miller Rubber Co., The, 8% pfd.	70	72
Mohawk Rubber Co., The	71	80
Phœnix Rubber Co., com.	..	15
Phœnix Rubber Co., pfd.	..	80
Portage Rubber Co., The, com.	..	1
Portage Rubber Co., The, 7% pfd.	..	2
Republic Rubber Corporation, com.	17c	25c
Republic Rubber Corporation, 7% pfd.	10	15
Republic Rubber Corporation, 8% pfd.	..	2½
Rubber Products Co., The	35	60
Standard Tire Co., com.	..	80
Standard Tire Co., pfd.	..	85
Star Rubber Co., com.	..	90
Star Rubber Co., 8% pfd.	..	40
Swinehart T. & R. Co., com.	..	70
Swinehart T. & R. Co., 7% pfd.	..	

A RETRACTION

Among the new incorporations listed in THE INDIA RUBBER WORLD for October 1, 1921, a part of the item in regard to A. Schrader's Son, Inc., of Ohio, was incorrectly stated. The item should read that this company is authorized to manufacture and deal in tire valves and pressure gages of all kinds. The office of the corporation within the state of Delaware is with the Corporation Trust Company of America, Du Pont Building, Wilmington, Delaware.

INVENTOR OF THE VACUUM MOLDING PROCESS

FRED THOMAS ROBERTS, of Philadelphia, Pennsylvania, inventor of the vacuum process of making hollow rubber articles and numerous methods and machines for adapting it to various lines of goods, was born in Deadwood, South Dakota, in 1884. Following his graduation from the Omaha High School, Omaha, Nebraska, in 1903, he became an inventor and has numerous patents to his credit that are well known to the rubber industry.

FRED T. ROBERTS

The plugless tennis ball, now used all over the world, together with the method and machinery for making it, was his first success in rubber goods manufacture. Then came the plumbers' valve ball, toy balls, bulbs and a seamless and spliceless inner tube, all of which employ different methods and machines.

Mr. Roberts is secretary and treasurer of Paramount Rubber Consolidated, Inc., a Delaware corporation that was organized in 1919 to utilize the Roberts inventions, manufacture and deal in rubber goods. The firm's offices are at 5232 Germantown avenue, Philadelphia, Pennsylvania, and 120 West 32nd street, New York, N. Y., and their factory for the manufacture of rubber play balls, solid balls, plain and decorated, and patented molded designs is located at Little Falls, New Jersey. The company has licensees in many countries under the Roberts patents.

THE RUBBER TRADE IN NEW JERSEY

By Our Regular Correspondent

THE rubber goods manufacturing situation in New Jersey has taken on a peculiar turn, some plants working night and day, others operating but a few hours a week or being closed. The Lambertville Rubber Co. closed on October 12 for an indefinite period. The New Jersey Rubber Co., situated at the same place, has been compelled to place a night shift at work.

The Ajax Rubber Co. Inc., Trenton, is working three shifts a day, while its Racine, Wisconsin, plant is running two eight-hour shifts. The company has decided not to build up any surplus stock of finished tires and is shipping them as fast as they are produced. All the high-priced crude rubber on hand has been disposed of and the firm is buying at lower prices. About 6,000 tires, representing equipment for two models of the Dodge, Oldsmobile and Buick cars, are being shipped weekly from the Trenton plant.

At the Bergougnan Rubber Corporation plant 250 men are employed and the factory is working with a night shift. Tires and tubes are manufactured exclusively. Extra hands may have to be placed at work.

At the Thermoid Rubber Co. plant it was said that there is no assurance of what orders the next day may bring. The plant

is operating at about 60 to 70 per cent capacity. The bulk of the business is being done in tires, but the belting, brake lining and hose departments are picking up.

The Hamilton Rubber Co. is operating at about 75 per cent capacity with no immediate sign of improvement in business. The same conditions prevail at the Empire Rubber & Tire Corporation factory.

THE RUBBER MANUFACTURERS' ASSOCIATION OF NEW JERSEY

The Rubber Manufacturers' Association of New Jersey, was recently incorporated at Trenton for the purpose of improving trade conditions, to exchange technical information and advance the interests of the rubber industry in general. The membership is made up of prominent rubber manufacturers and the offices of the new organization are at 709 Broad street, Bank Building, Trenton. John V. B. Wickoff is the agent in charge.

The following manufacturers have been chosen as trustees: John S. Broughton, president of the United & Globe Rubber Co., Trenton; Charles E. Stokes, vice-president, of the Home Rubber Co., Trenton; A. Boyd Cornell, secretary of the Hamilton Rubber Co., Trenton; William H. Sayen, Jr., of Princeton, treasurer of the Mercer Rubber Co., Hamilton Square, New Jersey; and John J. Voorhees, of the Voorhees Rubber Manufacturing Co., Jersey City.

It is believed that an increase in the rubber industry of the state will result through the forming of the Association. Trenton now has approximately thirty rubber factories of various types and the historic town is often termed "The Rubber City." The Association will meet monthly and hold discussions relating to the rubber industry in general.

TRENTON NOTES

The United & Globe Rubber Co. is the only Trenton plant of its kind where rubber tiling is made. The company began its manufacture some time ago and recently supplied all that product used in the new $1,700,000 Stacy-Trent Hotel at Trenton.

The Bergougnan Rubber Corporation, Trenton, has increased its capital from $2,500,000 to $4,000,000.

The creditors of the former Trent Rubber Co., Trenton, have incorporated Trent Rubber Co. Inc., which acquired by purchase from the receiver the plant and properties of the former concern, on Enterprise avenue. This factory can produce 300 tires and 500 tubes daily with present equipment, and has plant area to accommodate equipment for three times that production. The officers of the new corporation are: Thomas H. Thropp, president; James H. Morris, vice-president, and Newton A. K. Bugbee, treasurer and secretary.

Joseph Papier, owner of "Joe's Tire Shop," Trenton, has been appointed Trenton distributer of the Hanes tires, manufactured by the Hanes Rubber Co., Inc., Winston-Salem, North Carolina.

Exhibition booths at the Trenton Fair were occupied by the Thermoid Rubber Co., Pocono Rubber Cloth Co., Puritan Rubber Co., Acme Rubber Manufacturing Co., United & Globe Rubber Co., Globe Rubber Co., Semple Rubber Co., Essex Rubber Co. Inc., Home Rubber Co., and the Joseph Stokes Rubber Co. The Thermoid Rubber Co. gave away several thousand miniature balloons each day. All the rubber displays were very attractive.

The employes of the Ajax Rubber Co., Inc., and the Joseph Stokes Rubber Co. were recently given fire drills by the Trenton Fire Department to prepare them in case of need.

The Cadwalader Rubber Co. has removed its establishment from South Logan avenue to a new place on East State street, Trenton. The Universal Tire & Tube Market has a new and enlarged establishment on Perry street, while the Tire Sales Co. has a new store on the same thoroughfare. The Excel Tire & Tube Vulcanizing Co., a new concern, is located on Hamilton avenue. The People's Tire Hospital has opened an establishment at 315 South Broad street. The United States Rubber Specialty Co., has a new store on Gladstone avenue, and the National Tire Co. has a large establishment on Princeton avenue, Trenton. All these changes were made recently.

MISCELLANEOUS NEW JERSEY NOTES

Authority to sell the plant of the Hardman Rubber Corporation, of New Brunswick, has been given to Edmund A. Hayes, receiver, by Vice-Chancellor Backes, after the latter had decreed a foreclosure on a $210,000 mortgage on the factory. It is understood the Stanwood Rubber Co., of Elizabeth, which also has been in financial straits, controlled the stock of the Hardman company. The Hardman company was formerly located at Belleville, where rubber goods were its chief product. The mortgage had been on the New Brunswick plant since 1918, when the factory came into the hands of the Hardman organization from the Endurance Tire & Rubber Corporation. Receiver's fees of $4,000 and counsel fees of $2,000 were also allowed by the court.

Manning Stires, a New York City attorney, and Stanley P. Woodard, president of the Gillette Rubber Co., Eau Claire, Wisconsin, have purchased the plant of the Stanwood Rubber Co., situated between Elizabeth and Newark. The sale took place before Vice-Chancellor Backes, at Elizabeth, and the price paid was $360,000. The plant is subject to a mortgage of $300,000. John P. Kirkpatrick, of New Brunswick, receiver of the concern, states that the sale was accepted by the court as a step preliminary to the reorganization of the company and an ultimate resumption of business. The court granted a petition of the Union County Trust Co., of Elizabeth, that it be given preference on a claim of $9,000, the indebtedness having been created through an overdraft. Testimony brought out the fact that the $300,000 mortgage had been subject to foreclosure, a year's interest having been due. The mortgage is held by the Union Trust Co., of Jersey City. The total indebtedness of the concern was placed at $610,000, of which the Gillette Rubber Co. has a claim for $55,000, and Edward Hutchins, of Wisconsin, has a claim for $12,000. Claims of unsecured creditors amount to $300,000. Plans for new financing are being prepared.

THE RUBBER TRADE IN RHODE ISLAND

By Our Regular Correspondent

IMPROVED conditions are reported from all the rubber manufacturing plants in Rhode Island and it is estimated that there is a very material increase in the number of workers now employed as compared with any time for nearly a year past. This improvement is largely due to the awakening activity in the footwear market which has resulted in an incipient boom, although the manufacturers are very optimistic that the rubber industry is swinging into line with other industries that are slowly but consistently returning to normal conditions. Throughout the country, dealers have been gradually reducing the large stocks of goods which were on hand when the crash in prices came, so that there is an increasing demand for goods that promises well for a stabilization of business at a comparatively early date.

Things are beginning to look brighter at all the plants, especially at the Bristol factory of the National India Rubber Co., where operations were resumed early in the month, and if favorable conditions continue the factory will probably run on full time for the winter. On October 24, owing to the improved conditions in the sale of Keds it became possible to increase production and that division went into a full time schedule of a 5½-day, 48-hour week. Additional girls were hired in the stitching department and the indications were that a large number of the former employes with good records will be rehired as fast as demand warrants. The situation is becoming more encouraging each week.

Deeds transferring all the property of the Ninigret Co., Inc., to The Fisk Rubber Co. were filed on October 11 with City Clerk Herbert A. Fuller in Pawtucket, following the absorption of the Ninigret mills by the Fisk company last month. At the same

time there was filed a first mortgage deed covering all the property of The Fisk Rubber Co. in this and other states, the Chase National Bank of New York being named as the mortgagor. The mortgage is to secure the $10,000,000 issue of 20-year gold bonds, plans for which were published in THE INDIA RUBBER WORLD, October 1, 1921.

It is understood that The Fisk Rubber Co. took over the Ninigret properties, which it had controlled, and the Federal Rubber Co., in order that it might pledge these properties for the bond issue. The Ninigret Co., Inc., was formed in September, 1919, when it bought the old Greene & Daniels cotton mill in Pawtucket. Subsequently it acquired the property of the Ninigret Mills Co. at Westerly, Rhode Island, and Stonington, Connecticut. It has manufactured cotton yarn at its Pawtucket plant and woven this yarn into auto tire fabric at the Westerly and Stonington plants. Most of the production was sold to the Fisk companies.

The Pawtucket plant has been closed for the last ten months, but the Westerly and Stonington mills are now operating four days a week. The company has also been operating a thread mill in Jewett City, Connecticut, owned by The Fisk Rubber Co. The deed that has just been filed makes over fifteen parcels of land formerly owned by the Ninigret Co. in Pawtucket, Westerly and Stonington. Revenue stamps attached to the deed indicate that the purchase price amounted to $350,000. The mortgage deed covers all the new properties in Pawtucket and Westerly and in Connecticut and Wisconsin, as well as its older properties in Chicopee, Springfield, and Boston, Massachusetts, and Albany, New York.

According to a report that has been sent to the creditors and stockholders by the Industrial Trust Co., as receiver for the American Wringer Co., Woonsocket, Rhode Island, the plant was operated from March 15 to July 15 and the product manufactured was sold. The gross volume of sales amounted to $665,764.38, which resulted in a net loss of $18,937.20, after allowing for full depreciation.

The inventory of raw material was decreased approximately $200,000, and the cash on hand was increased $242,756.77. Accounts and notes receivable were decreased from the last statement by collection and charging off approximately $130,000 because of questionable value. There are various extra expenses included in the period covered by this report which will not occur in the future. In addition, the general overhead expense of the company has been greatly reduced. Many changes have been made in the organization which should result in greater efficiency. The number of styles of wringers has been substantially reduced and an active effort is now being made to increase the sales. While business was extremely dull during the summer, there has been an improvement recently which should result in a further reduction of the inventories of raw material and an increase in the amount of cash.

Edward E. Bunn, who for the past five years had been manager of the employment department of the National India Rubber Co., at Bristol, has resigned and has been succeeded by E. N. Kinsley, who has been an assistant to E. A. Currier, industrial relations manager. Mr. Bunn has been connected with the concern for 14 years. In 1907, he entered the selling department where he remained until 1910, when he became private secretary to the late LeBaron C. Colt, general manager of the company. On the death of Mr. Colt in 1916, Mr. Bunn assumed the office of manager of the employment department.

Athletic contests for men and women featured the first annual outing of the employes of the American Electric Works & Washburn Wire Co., held September 25, at Duby's Grove on the banks of the Pawtuxet river. Following the dinner which was served in the grove, an interesting address was delivered by Charles Wray, who expressed the belief that the practice of holding an outing every year, inaugurated on this occasion, would gain in popularity among the workers.

THE RUBBER TRADE IN MASSACHUSETTS

By Our Regular Correspondent

LONG-CONTINUED optimism on the part of Massachusetts rubber goods manufacturers is at last reaping its reward. Sales and production in almost every line are undergoing an improvement so notable that even the reclaimers are beginning to feel it. The tire demand is well sustained owing to continued warm and pleasant weather, and few manufacturers have curtailed their recent production rate much if any. Mechanical rubber goods are more active in all lines, due to improving general business. The buying season for druggists' sundries found stocks very low and orders are reported better than for two years past.

Rubber footwear, very largely a New England industry, continues to improve. Retailers are showing a disposition to stock up in anticipation of a severe winter and large late orders are being received. Tennis orders for next season appear to be arriving in better volume that at the same time last year. Most footwear factories are busy and recruiting their forces through newspaper advertising. A record business is anticipated for 1922.

BOSTON NOTES

W. J. Jarvis, succeeding the late H. U. True, has been made manager of the Boston branch of the Manhattan Rubber Manufacturing Co., at 60 Pearl street.

C. M. Evans, for twelve years manager of commercial tires for the Hood Rubber Co., Watertown, is now the head of the Hood Tire Sales Co., with stores at 1041 Commonwealth avenue, Boston, and 25 Mt. Auburn street, Watertown.

The sessions of the Industrial Relations Conference were an interesting feature of the sixth annual meeting of the Associated Industries of Massachusetts, held at the Copley-Plaza and Westminster Hotels, Boston, October 27 and 28. Among the numerous speakers on the program were Cyrus S. Ching, supervisor of industrial relations, United States Rubber Co., and Harold L. Robinson, employment manager of the Crompton & Knowles Loom Works, Worcester.

About 300,000, or 19 per cent of the wage earners of Massachusetts, against the normal 8 per cent, were out of work on October 15, according to the State Commissioner of Labor and Industries. The September records of the Boston Public Employment Office show an increase of 18 per cent over August in orders from employers. This, however, represents a decrease of 32 per cent from September, 1920. Improving business in the rubber industry is again finding employment for most skilled rubber workers seeking it, while rubber footwear manufacturers are finding it necessary to recruit their forces through newspaper advertising.

Dr. R. N. Quinby, service manager of the Hood Rubber Co., Watertown, was on the program of speakers at the round table conference on reconstruction and rehabilitation of the industrial cripple, held September 30 at the State House, Boston, in connection with the health service section of the National Safety Council and the American Association of Industrial Physicians and Surgeons.

Everett Morss, president of the Simplex Wire & Cable Co., and of the Boston Chamber of Commerce, has pledged to President Harding and Governor Cox, of Massachusetts, the full support of the Chamber if the railroad brotherhoods strike. By a vote of the Chamber, declaring that "the fundamental principles of government are at stake," the chief executive is urged to "stand fast without compromise." Mr. Morss was recently appointed by Governor Cox a member of the Massachusetts Committee to Promote Employment.

MISCELLANEOUS MASSACHUSETTS NOTES

J. W. Williston, for seven years associated with the United States Rubber Co., and until recently manager of the clothing department of the Chicago, Illinois, office, is now connected with the selling organization of the Cambridge Rubber Co., Cambridge.

He will cover unrestricted territory with the "Camco" lines of rubber products, which now include rubber and cancas footwear, rubber clothing, molded goods and rubber fabrics.

The Bailey Rubber Heel Co., Beverly, has purchased the so-called Cameron Co.'s property on River street, where the firm was formerly a tenant. It consists of a four-story brick building, two two-story wooden buildings, a power house and wharves on the Bass River frontage. Business has expanded so rapidly since the company started manufacturing in October, 1920, that enlarged quarters became necessary.

It is announced that S. G. Byam has been recently appointed chief chemist of the Plymouth Rubber Co., Canton, Massachusetts. Mr. Byam formerly held a similar position with the Fairfield Rubber Works of E. I. du Pont de Nemours & Co.

NEW ENGLAND TIRE AND RUBBER COMPANY OPENS NEW PLANT

Officials of the New England Tire & Rubber Co., Holyoke, Massachusetts, expect to have their new plant in full operation by November 1. The three-story and basement factory buildings which are on South Main street, are 200 feet long, 100 feet wide, and contain about 70,000 feet of floor space. They are equipped with the most modern machinery and the plant capacity is estimated at 1,000 tires a day.

The Holyoke cord tires manufactured here are being sold in Boston through the City Rubber Co., while the increasing business of the organization warranted the recent establishment of salesrooms in New York City also, at 43 East 47th street.

PLANT OF THE NEW ENGLAND TIRE & RUBBER CO., HOLYOKE, MASSACHUSETTS

The names of the officers and directors of the New England Tire & Rubber Co. are: John Kearns, president; E. J. Kearns, vice-president and production manager; J. S. Bernstein, secretary; C. S. Huntley, treasurer and general manager. The directors, besides the officials mentioned, are: T. E. Morris, Joseph F. Ranger and Gilbert B. Bogart.

CHANGES IN FISK'S EXECUTIVE PERSONNEL

The Fisk Rubber Co., Chicopee Falls, concurrently with the completion of its recent financing has increased its board of directors from seven to nine members. Resignations were accepted from J. D. Anderson, F. T. Ley and G. A. Ludington. These were elected to fill the vacancies created: William F. Cutler of New York, N. Y.; James Dean, of Boston; Richard S. Russell, of Boston, and Ralph H. Bollard, of New York, N. Y. The other members of the directorate are: Harry T. Dunn, of New York, N. Y.; Harry G. Fisk, of Springfield, Massachusetts; Edward H. Broadwell, of Longmeadow, Massachusetts; Benjamin H. Pratt, of Milwaukee, Wisconsin; and Stedman Buttrick.

Under the recent adjustment the executive departments of The Fisk Rubber Co., Federal Rubber Co. and the Ninigret Co. are centered in New York, N. Y.; and the treasury department becomes a part of the New York organization. Harry G. Fisk, the former treasurer, on account of outside interests located in Springfield, Massachusetts, has resigned to become vice-president of the company, and will continue to make his headquarters at Chicopee Falls. Robert B. McGraw, for a number of years the assistant treasurer, has been elected treasurer and will be located in New York, N. Y. J. W. Rowland has been elected assistant treasurer.

The present officers of the company are as follows: President, Harry T. Dunn; vice-president, Harry G. Fisk; vice-president and general manager, Edward H. Broadwell; vice-president and factory manager, Fisk division, J. D. Anderson; vice-president and factory manager, Federal division, Benjamin H. Pratt; vice-president in charge of rubber and fabric purchases, G. A. Ludington; treasurer, Robert B. McGraw; assistant treasured, J. W. Rowland; comptroller, E. M. Bogardus; secretary, A. A. Leiser, Jr.

Pending the completion of the new Fisk Building at 57th street, Broadway and Eighth avenue, New York, N. Y., about December 1, the executive offices will remain at 52 Vanderbilt avenue.

THE RUBBER TRADE IN OHIO

By Our Regular Correspondent

THE past month has been a period of revelations in the rubber industry. While the world as a whole was giving Akron its sympathy for its so-called misfortunes, the rubber factories were making new records in production. Practically every prediction made regarding business during the past six months was fulfilled by announcements during the month. It is expected that at least one-half of the Akron factories will make more units during 1921 than during the record year of 1919. In fourteen months the rubber industry passed through the greatest financial depression in the history of the country. It was the first to be hit and the first to be back on its feet.

TIRE PRODUCTION CONTINUES

The tire industry is holding up much better than could have been expected at this time of the year when orders should be falling off. However, they continue to come in with surprising regularity. While Firestone has decreased from the peak of the year of 28,000 tires a day to 20,000 a day and Goodyear has decreased to less than 16,000 a day, Goodrich is preparing for greatly increased production by adding 600 men to the tire building and finishing departments. It is reported that the company has sold two tires for each one built during the summer and that the present stock of completed tires is less than one month's supply. The preparations for getting into greater production by the most conservative company in Akron is looked upon as a favorable augury.

According to unofficial, but authoritative information, all production records will be broken this year by the Firestone Tire & Rubber Co. It is reported that the company has produced more tires daily during the past six months than any factory in the United States. During the summer, production was 28,000 tires a day and, for a month after this, peak production stood at 25,000 to 26,000 a day. Recently, the output was decreased by a few thousand a day when part of the third shift was laid off.

The Goodyear Tire & Rubber Co. will break all previous sales records this year. The total sales for 1920 amounted to $205,000,000.

The Miller Rubber Co. will be without any floating indebtedness and practically without any high-priced commitments at the beginning of the new fiscal year, according to reliable reports. The floating debt is now below $750,000, one-half what it was a month ago. The month has also seen a good share of the last $1,000,000 worth of high-priced fabric used up. Total output for the present year will equal in units that of last year, while sales will be somewhat less because of decreased tire prices.

THE TIRE SITUATION

Perhaps never before have tire dealers had smaller stocks than at present. In many instances the factories are solicitous regarding their regular customers because the dealers have reduced stocks to such an extent that they are practically out of business and are compelled either to telegraph the factories for tires or turn the customer over to dealers representing other factories.

The report that at the end of the first half of the year only 4,500,000 tires, or less than one tire for each two cars in the country, were in stock, was correct for July, but since that time, stocks have gone even lower, and unless some stocking up is done during the coming winter the tire trade will find itself in a precarious position in the spring. Undoubtedly the Akron factories will stay very close to the sales ticket during the winter and insist that if any stock is to be manufactured the dealer must bear his portion of the financial burden. The matter of risk is no longer referred to because of the guaranties made by the producers, and the present shortage makes sales absolutely essential in the early spring.

The number of tires produced per man in Akron rubber factories will decrease materially when the demand for larger tires becomes greater. At the present time the factories are manufacturing tires for the 4,000,000 Ford cars in operation and the Fords and small cars which are being manufactured.

Comparatively few large tires are in demand because many of the large car manufacturers have not yet resumed production on a large scale and the owners of large cars in many instances are using small cars. Small tires are made largely by machines, whereas the tires used on the larger cars are made by hand. When the larger tires are again produced in quantity the output per man will decrease and the number of men employed will increase.

IMPROVED DEMAND FOR OTHER RUBBER GOODS

Early mail orders indicate that the country is facing an actual shortage of rubber footwear. Already the factories have received large mail orders and dealers are beginning to build up their stocks because of the general opinion that the coming winter will be severe. With the exception of arctics, the holdover from last year is comparatively small, while stocks of boots and ordinary rubbers are reported as the lowest in the history of the industry. It is believed that, by the time the actual selling season opens in January the plants will be ready to go ahead on a 100 per cent basis.

The time has arrived when actual improvement in mechanical rubber goods lines can be recorded. All lines of merchandise are showing about the same healthy business increase.

The druggist's sundries trade is also showing a revival, due to the general impression of a hard winter and the fact that stocks are lower at the present time than for many years. Mail orders are coming in numbers and for larger amounts of goods than for the past two years.

AKRON NOTES

The American Rubber & Tire Co., Akron, is working the day shift at capacity and the curing department three shifts a day. This is made possible on cord tires because they can be held over after completion for the night shift. The American has enjoyed good business during the major part of the year and it would not be surprising if the output for the year was not very close to that of the preceding year.

The India Tire & Rubber Co., Akron, will make more tires during the present year than during any previous season. The exact percentage of increase is not yet known, but at the beginning of August, production was equal to the 1920 record. Sales have slackened somewhat, but they have not decreased as was expected at this time of the year.

The Interlocking Cord Tire Co., Akron, will be ready to start production under the new management within a few weeks, it is stated by Edward Kohl, new president of the company. The former stockholders raised some money among themselves and with other assets have approximately $42,000, either in hand or promised, to start operations. The fact that the smaller factories especially are enjoying excellent business has done much to encourage the Interlocking organization.

The Akron Salvage Co. has leased for five years the Ohio Wire Goods Co. plant, and will be in the new quarters by November 1, if present plans materialize. The new quarters have 20,000 feet of floor space and with the one-story brick building go seven acres of land. Modern equipment has been purchased and when the new building is occupied, the company will be ideally located and equipped. Salvage from Akron factories is the principal product handled, although it is not doubted that in time the company will expand and handle salvage in other industrial centers.

The Philadelphia Rubber Works Co., Akron, reclaimer of rubber, reports that production is running about one-half normal. The fact that lines in which reclaimed rubber is used are still waiting for an improvement in general business before going back to normal production is holding the reclaiming plant back somewhat. The production of heels and other rubber goods in which reclaimed rubber is a principal ingredient has done much to keep the plant going this year.

The Adamson Machine Co., Akron, reports that the past few weeks have seen a material advance in orders, which has resulted in the plant increasing production materially. It is believed that the improvement is the beginning of a gradual growth in business which will continue through the winter.

The Goodyear Tire & Rubber Co., Akron, has announced the appointment of Frank K. Espanhain as export manager of the company. He was formerly employed in St. Louis, Missouri, and Milwaukee, Wisconsin, and just previous to coming to Goodyear was engaged in the export tire business in New York, N. Y.

E. M. MacIntosh, of the development department of The Goodyear Tire & Rubber Co., Akron, has left for an extended trip through China and the Orient in the interests of the company. Previous to coming to Goodyear, he traveled through Europe as courier for the Peace Conference.

William H. Kroeger, identified with the Coventry Land & Improvement Co., subsidiary to the Firestone Tire & Rubber Co., Akron, has resigned to enter private business. The collection work of the company has been turned over to Homer Campbell, of the Home Owners' Investment Co. Practically all the 1,100 houses built by the Coventry organization have been sold and payments are quite regular. The payments have been decreased as have those of Goodyear Heights to conform with the new wage scales in Akron.

The O'Neil Tire & Rubber Co., has changed its name to Hopkins Rubber & Manufacturing Co., and will manufacture O'Neil tire repair equipment and the Arthur rubber footwear vulvanizer, besides acting as manufacturer's distributer for the American-Akron line of tire repair material and accessories. Headquarters are at 350 Bowery street, Akron.

Akron offices of Poel & Kelly, Inc., have been removed from the Second National Building to 8 South Broadway. Frank T. Lahey is the Akron representative of this firm of crude rubber brokers, whose main offices are at 347 Madison avenue, New York, N. Y.

Hugh Allen has been made manager of the publicity department of The Goodyear Tire & Rubber Co., Akron.

The Goodyear Industrial Assembly will continue a part of the shop management system of Goodyear and as the result of elections held October 10, thirty-one new assemblymen will take their seats in November. A total of 6,500 men and women employes of the company participated in the election. A change which has been made in the republic is the provision for a foremen's precinct which will be represented by Samuel Settle, a former senator. The change was made because of difficulties foremen have experienced in representing the men in their departments and later carrying out the orders of the management and conforming to the wishes of the republic.

The Pyramid Rubber Specialty Co., with offices at 13 West Long street, Akron, Ohio, is at present confining its efforts to the manufacture of one product only—a transparent, non-adhesive nipple. Officers of this company are: L. N. Oberlin, president; A. E. McDonald, vice-president; R. C. Raw, secretary and treasurer, and Roy Sanderson, formerly of the Davol Rubber Co., plant manager.

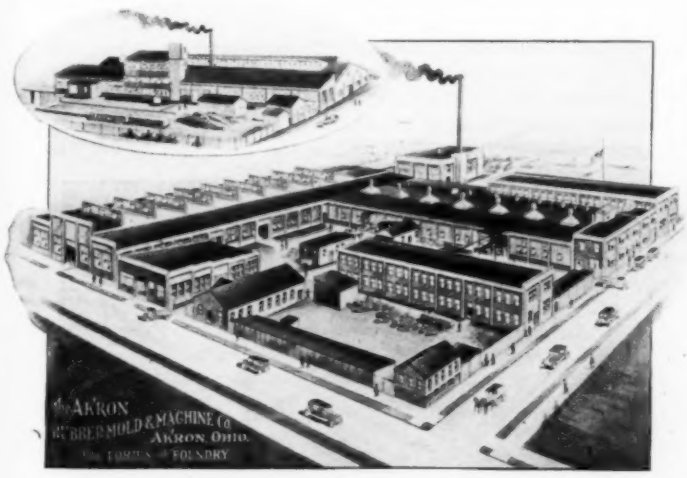
Announcement is made of the recent appointment of A. G. Partridge as vice-president and general sales manager of The Star Rubber Co., Inc., Akron, Ohio. Harry A. Grubb, previously associated with the Firestone organization and later vice-president and general manager of The Oldfield Tire Co., is now also connected with the Star company as assistant manager.

Pell & Dumont, Inc., importers of crude rubber and gums, with New York offices at 68 Broad street, recently appointed F. A. Bonstedt manager of the company's Akron office, at 423 Ohio Building. Mr. Bonstedt has a wide acquaintance among manufacturers in the Akron district, and also throughout the West.

Victor C. Blandin, crude rubber broker, has recently opened an office in the Ohio Savings & Trust Building, Akron, Ohio. Mr. Blandin has been actively engaged in the rubber business for the past fifteen years in this country and also the Far East where he engaged in the production and treatment of plantation rubber and jelutong. He has many friends among rubber importers and manufacturers.

THE AKRON RUBBER MOLD & MACHINE CO.

The Akron Rubber Mold & Machine Co., originally incorporated in 1909, at Akron, Ohio, has steadily developed both in the amount of the company's business and in the size of the plant. Previous to its organization, however, Stanley W. Harris, now president and general manager, and G. F. Hobach, now secretary and treasurer, were connected, in 1904, with the old Taplin-Rice Co. It is an interesting fact that while these men were in the employ of this company, the first core and mold for the manufacture of automobile tires were made by the Taplin-Rice Co. for one of the large establishments of Akron.



PAST AND PRESENT PLANTS OF THE AKRON RUBBER MOLD & MACHINE CO.

Realizing the possibilities of the tire equipment business Mr. Harris and Mr. Hobach began operations in a small two-story building, the nucleus of the present large and busy factory. Six persons were then employed, where now the company has, at full production, 325 people on its payroll, while the plant is, for its particular line of work, one of the largest in the country.

In 1916, with the purpose of more than doubling the plant capacity, an additional building was erected, while other already existing buildings adjoining were purchased. In this year, owing to the rapid growth of the business, the capital stock of the company was also increased from $60,000 to $300,000. The organization of the Portage Foundry, capitalized at $150,000, and the second increase from $300,000 to $600,000 of the capital stock of the Akron Rubber Mold & Machine Co., followed in 1917.

In July, 1920, preparations were again being made for more than doubling the capacity of the plant, which at that time covered more than 75,000 square feet of floor space. At this time a new power house was also built and additional machinery installed in the new buildings. The company specializes in "everything in tire-making equipment." In addition to the officers mentioned, W. E. Wilson is vice-president and assistant general manager.

MISCELLANEOUS OHIO NOTES

The Lambert Tire & Rubber Co., Barberton, Ohio, is working full force with one shift a day. Approximately 100 tires are being made daily. Until the first of the present month the company was operating a night shift. Operations have been good since early last spring.

W. A. Johnston, president of the Rubber Products Co., Barberton, and retiring president of the Barberton Chamber of Commerce, has written a book entitled, "My Own Main Street," in which he lauds the small town. It is an answer to a popular book in which the small town is pictured as anything but pleasant.

The Kendall Tire & Rubber Co. and the Ariston Tire & Rubber Co., both of Massillon, Ohio, and the Fidelity Tire & Rubber Co., Chicago, Illinois, are defendants in a suit filed in the common pleas court by The First National Bank of Louisville, Ohio, to foreclose a mortgage and to collect $22,000, said to be due on promissory notes. Judge Ake named W. S. Adams as receiver to take charge of the encumbered property.

The Excel Rubber Co., Wadsworth, Ohio, reports excellent business in men's rubber belts. Orders now on hand assure the company almost normal production in this line until next spring. The tire business is also good. Approximately 200 tires are being made a day. Repairs were recently completed in some departments of the plant.

The reorganization of the Liberty Tire Corporation, with main offices at Cleveland, Ohio, and factory at Carey, Ohio, has resulted in the election of the following officers: Milo E. Jordan, president; Wesley Patterson, vice-president; L. C. Sturgis, formerly with the Firestone Tire & Rubber Co., secretary; George Ash, treasurer; and Irvin Jordan, general manager and managing director. The plant is new and fully equipped with modern machinery of the latest type. One of the buildings is of three-story concrete construction, designed especially for a tire factory. The company, with plenty of material on hand, has begun operations, which will continue night and day for the present. The schedule includes the production of approximately 1,000 tires every 24 hours, both cord and fabric tires being manufactured. The Liberty Tire Corporation, which has no bonded or mortgaged indebtedness, has a capital of $2,000,000, one-half paid. Officials of the company claim that prospects for the future are most encouraging.

Work was recently resumed at the plant of The Gordon Tire & Rubber Co., Canton, Ohio, under the management of A. G. Ryley and A. B. Clark, receivers. Production, begun in a small way, has increased rapidly, so that the plant is now running at more than 50 per cent capacity. The outlook for the future is considered most encouraging.

George L. Morse, for the past two years assistant auditor of The Mason Tire & Rubber Co., Kent, Ohio, has been appointed auditor to succeed A. C. Grundman, who has resigned. Mr. Morse was formerly connected with The Ohio Manufacturing Co. and later with The Ideal Tire & Rubber Co., of Cleveland, Ohio. H. M. Johnson, credit manager, has been made assistant treasurer.

RUBBER TRADE IN THE MID-WEST

By Our Regular Correspondent

MID-WEST RUBBER MANUFACTURERS' ASSOCIATION

THE regular monthly meeting of the Mid-West Rubber Manufacturers' Association took place, October 11, at the Morrison Hotel, Chicago, Illinois. Notwithstanding the fact that only 28 members were in attendance, the occasion had much of interest and was voted, at its conclusion, as "the best small meeting that has yet been held."

The principal speaker of the occasion was Frank B. White, of The Agricultural Advertisers' Service, who spoke in the absence of John Fletcher, of the Fort Dearborn National Bank. Mr. White, in an optimistic talk, said that the farmers throughout the country were doing their part, during the prevailing trying times, notwithstanding adverse conditions, and urged that laborers and capitalists follow their example, as all three branches of industry are inseparably united and must work in harmony.

An interesting account followed, by B. F. Kinder of the Binney & Smith Co., concerning the manufacture of carbon gas black, and the progress and development of the industry was traced from the time it was first manufactured in Indiana to the present enormous scale of production in Louisiana and other states. Other speakers were: Arthur E. Swanson, Swanson, Ogilvie & Co., formerly a member of the executive board of the Firestone Tire & Rubber Co.; R. G. Conant, Brighton Mills, Inc.; M. W. Rozar, Bibb Manufacturing Co.; F. L. Barnwell, Jenckes Spinning Co.; L. E. Beitler, The Barrett Co.; Preston E. Roberts, and Charles E. Wood. The latter speaker furnished some interesting information in regard to the rubber industry of Brazil. The other speakers mentioned referred to conditions as they had found them in the automobile industry; the insulated wire industry; the cotton goods and dyestuff industries; and the synthetic rubber industry.

President W. W. Wuchter, The Nebraska Tire & Rubber Co., urged members to interest their various Chambers of Commerce in questions affecting production, consumption, and employment, and believed that if this were done the same good results would follow which had been experienced in Omaha.

The next meeting of the Association will be held November 8. It should be noted that the address of the Association offices has been changed from McCormick Building, 332 South Michigan avenue, to 607 South Wabash avenue, Chicago, Illinois.

ASSOCIATE MEMBERS' MEETING

At the first meeting of the associate members, Edward G. Gereke of St. Louis was elected permanent chairman and A. C. Eide of the American Zinc Co., assistant chairman. Resolutions were adopted whereby the associate members, desiring to make the Association a complete success, and to increase the attendance at the regular monthly meetings, will refrain from soliciting manufacturers' business at the meetings unless an interview is requested.

The associate members will make these meetings a source of valuable information by giving regular members accurate market news.

Suggestions and remarks concerning these resolutions were made by F. W. Knoke, American Zinc, Lead & Smelting Co.; Thomas Follen, Lion Tire & Rubber Corporation; J. B. Gabeline, Standard Four Tire Co.; and others.

MISCELLANEOUS MID-WESTERN NOTES

The Firestone Tire & Rubber Co., Akron, Ohio, has appointed manager of its branch at Compton and Locust streets, St. Louis, Missouri, W. G. Sabine, who was formerly manager of the company's Akron branch.

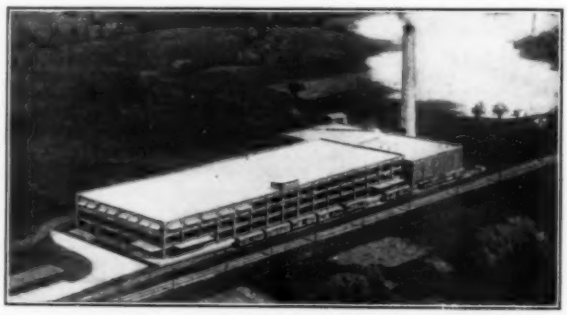
The Joplin Center Cord Tire & Rubber Manufacturing Co., 813 Main street, Joplin, Missouri, is remodeling its factory to manufacture tires and rubber. The cost of improvements when completed will be approximately $25,000 or $30,000. The officers of the company are: C. H. Malody, president; J. H. Courvoisier, vice-president; J. L. Courvoisier, treasurer; and Neil Foster, secretary.

The A. J. Stephens Rubber Co., Inc., manufacturer of tires, tire accessories, and fabric products, with main offices at Kansas City, Missouri, will continue to distribute the output of The Kansas City Tire & Rubber Co., while a new organization, under the name of Rubber Products Manufacturing Corporation, has been formed to operate the plant. The Stephens Tire Stores Co. will operate a number of general stores throughout the West and South, a dozen of these stores having already been established. Others will be added later. The A. J. Stephens Rubber Co. is capitalized at $1,500,000. Officers of the company are: A. J. Stephens, president, and C. F. Stephens, vice-president, while P. E. Warner is manager of the Rubber Products Manufacturing Corporation.

J. H. Greer has been appointed manager of the Kansas City, Missouri, branch of The McGraw Tire & Rubber Co., Cleveland, Ohio. Mr. Greer, who succeeded W. S. Chambers, on the latter's resignation, has had much experience in the rubber industry, having served as branch manager for several well-known tire companies, among them the United States Tire Co. Mr. Greer has a wide business acquaintance throughout the Southwest.

Rubber and Cements, Inc., 3026-3030 South La Salle street, Chicago, Illinois, is a reorganization of the combined interests of the Lion Rubber Cement Co., and The American Eagle Rubber Cement Co. The new firm has not only a new personnel, but important changes have been made in factory equipment, and the plant is now in a position to render excellent service. The manufacture of cements is under the immediate supervision of A. P. Eves, who formerly held for eight years the position of chief chemist with the Goodyear Rubber Co. The officers are: Samuel J. Andalman, president; Samuel J. Green, secretary; and Sampson Andalman, treasurer.

The new plant of The Grand Rapids Tire & Rubber Corporation, Grand Rapids, Michigan, manufacturer of Corduroy cord tires, is now in full operation. The main factory building measures approximately 75 by 300 feet, and the power plant 70 by 100 feet. The plant capacity is 500 tires and 1,000 tubes daily. Officers of



PLANT OF THE GRAND RAPIDS TIRE & RUBBER CORPORATION

the company are: L. A. Brown, president; Clifton, G. Dyer, vice-president; Merwin J. Goldner, secretary; C. S. Dickey, treasurer; H. H. Swan, factory manager, and Leonard Rosin, sales promotion manager.

The Yale Tire & Rubber Co., New Haven, Connecticut, announces the appointment of M. E. Majors as district manager of the company's mid-western branch, 245 North Pennsylvania street, Indianapolis, Indiana. Associated with Mr. Majors are W. P. Westerhoff as assistant manager, and Charles Woodward and F. J. Sheppard as traveling representatives. E. C. Andrews is the general sales manager of the company.

According to a statement made by a former official all the stock and material of the Jasper Tire & Rubber Co., Jasper, Indiana, is being disposed of, while the plant was recently placed in the hands of Louis P. Mehringer, as receiver.

W. H. SALISBURY & CO., RUBBER MANUFACTURER

W. H. Salisbury & Co., Chicago, Illinois, have been carrying forward operations for several months at their new rubber factory, located at 411-421 North Morgan street. Installations at the plant included three mills, one three-roll calender, 11 double deck presses, vulcanizers, lathes, tubing and wrapping machines, and other equipment necessary to the proper handling of the

W. H. SALISBURY & CO.'S RUBBER MILL

varied assortment of material to be produced. The factory is within a mile of the general offices and salesrooms at 308-310 West Madison street.

The position of the company as dealers and distributers of rubber goods of every description is well established. Beginning operations along these lines in 1855, this company has, since that time, been in continuous service. In 1917 the salesrooms and offices were moved from 105 South Wabash avenue to their present location. With the reputation of being one of the earliest-established rubber dealers in the world, this company is now entering, with good auspices, the new field of rubber manufacturing.

THE RUBBER TRADE ON THE PACIFIC COAST

By Our Regular Correspondent

AN acute shortage in rubber footwear and a slackened demand for rubber belting and similar mine and mill goods were salient features of the Pacific Coast trade during October. Sales of tires and tubes continued good and mechanicals were in strong demand for the building trades. Coast representatives of leading rubber footwear factories in the East and Mid-West had cautioned customers months in advance about an almost certain scarcity of goods in the Autumn, but most buyers were so confident that prices would drop and production increase that they left their shelves almost bare. Recently they discovered that the expected did not happen, and now they are clamoring for the goods and are even willing to waive all discounts if their orders are given priority. But the footwear makers only remind them that they missed their chance.

The strike in the California oilfields has had a marked effect in slowing down sales of belting, suction and discharge hose, pump rubbers, etc. Even before the strike a much more cautious buying was noted among the larger oil companies, the tendency being to purchase goods only as needed and to carry very little reserve stock. In explanation of this policy it is said that some goods had deteriorated while in stock, and buyers decided to take a chance on higher prices and delayed delivery rather than to risk using goods that had aged in the storerooms.

Mining shows signs of resuming, but it is not likely that there will be much doing for a couple of months. Copper mining, a mainstay in Arizona, has been almost at a standstill, but rubber goods dealers hear that several of the larger concerns are getting ready for operations in the near future to meet a better demand for the red metal from abroad. Encouraged by the recent sharp advance in the price of silver, many silver mine owners in Nevada are planning extended operations and will need rubber supplies.

SAN FRANCISCO NOTES

Reports from commercial travelers who have recently touched at the far eastern and south sea ports state that the Germans are rapidly closing up all their old commercial connections that were broken during the war, and that they are preparing for an aggressive selling campaign of rubber as well as other goods "Made in Germany."

The latest mid-west tire concern to establish a selling agency on the Pacific Coast is the Henderson Tire Co., Columbus, Ohio. Don Lee, Van Ness and O'Farrell streets, San Francisco, has been appointed distributer.

The Hirsch-Blum Co., 1135 Van Ness avenue, San Francisco, has been appointed distributer of Kenyon cord tires and tubes in northern California by the C. Kenyon Co., 564 Atlantic avenue, Brooklyn, New York.

Pacific Coast manufacturers of tires are much interested in the recent reduction ordered in freight rates for tires shipped westward in carload lots. To a degree they have enjoyed a certain amount of protection from mid-western and eastern competition by reason of the comparatively high freight rates for tires, but many of them fear that much of this advantage will be forfeited under the new railroad tariff. Some tire makers, however, say they have little to fear from competition, as their production cost for equally good articles is less than that of their rivals a thousand or two miles nearer the Atlantic seaboard, and they can save something on crude rubber shipments, being nearer to the far eastern plantations.

LOS ANGELES NOTES

A considerable part of the 340-acre flying field—old Ascot Park—of the Goodyear Tire & Rubber Company of California, Los Angeles, will soon be utilized by the recently formed Arro-Plane Co., capitalized at $500,000. This concern is planning to erect a $100,000-plant on the grounds and to employ 300 men. A specialty of the new company will be huge heavier-than-air flying machines, some with a capacity of thirty passengers. It is stated that the factory will be equipped to turn out one of the largest airplanes in a week.

A direct factory branch for Dayton cord and fabric tires has been established at 845 Traction avenue, Los Angeles, with W. E. McCarthy as district manager.

The growth of the tire business in Los Angeles is well indicated by motor vehicle registration, the records showing 46,000 new automobiles from January 1, 1921, to October 1, and 1,868 new trucks in the same period.

An agency for Hydro-Toron tires and tubes has been established in Los Angeles, the Stephens Tire Company, 412 West Pico street, being in charge. Vice-president E. S. Phillips of the

Stephens tire factory, Kansas City, was a recent visitor in Los Angeles, having motored here without any tire trouble.

The principals and salesmen of southern California shoe findings wholesale concerns were recent guests of the Los Angeles Goodyear plant. The distributers of "Neolin" soles and "Wingfoot" heels were escorted through the mills and afterward entertained at luncheon in the office lunch room.

The Goodyear Textile Mills in Los Angeles are, it is said, working at about two-thirds capacity; that is, 22,000 of the 33,000 spindles being continually used. Production is given as 250,000 pounds of finished tire fabrics monthly. Recent advance in the price of cotton has materially improved the company's inventory values, and this has been reflected in a rise in price of the widely-distributed textile stock.

Southern California is a new field for Falls tires and Evergreen tubes. Although both products have been sold a long time on the upper part of the Coast, the lower section has been comparatively neglected. Increased factory equipment has enabled the makers to close a deal with the Millard-Smith Co., 1242 South Flower street, Los Angeles, to take care of the territory between Fresno and Mexico.

SOUTHWESTERN NOTES

The sharp upturn in the price of cotton has naturally gladdened Arizona and Southern California growers. The gloom that has hung over the plantations for many months has given way to optimism, and many extensions to planted acreage are planned. Growers expect the price advance to continue and that they will get at least 50 cents a pound for choice Pima that but a few weeks ago brought scarcely half that price.

The Pima Textile Industries is a new Phoenix, Arizona, enterprise headed by Shane Morgan, which plans to manufacture—probably near Los Angeles—tire and other fabrics for rubber manufacturers and others on the Pacific Coast. It is claimed that the concern will be able to easily underbid eastern textile makers who are handicapped by the high freight rate to New England for raw material and the equally high rate on the finished product to the Coast.

The acreage of cotton in Arizona for 1921 is given as 65,000 as compared with 180,000 for 1920. The carry-over is put at about 100,000 bales.

The E. M. Smith Co., Downey, California, a large producer of brake lining, has introduced a heat-treating process for carbonizing lining, which, it is claimed, insures a more uniform and dependable product. The plant is operating at full capacity and many new selling agencies have lately been established. The concern is an offshoot of the E. M. Smith Rubber Co., Los Angeles.

Pacific coast rubber manufacturers are interested in a report that two extensive beds of sulphur, one 35 feet thick, have been discovered in Lower California. M. C. and M. A. Turner, of San Diego, are planning to mine and market the sulphur.

The Spreckels "Savage" Tire Co., San Diego, is sharing in the general prosperity in the tire trade on the Pacific Coast, and reports a considerable extension lately in sales, especially of its new "Aristocrat" cord tire. The company announces that R. R. Crow has been appointed to take charge of its Dallas, Texas, branch, J. C. Lutz having resigned.

NORTHWESTERN NOTES

The Columbia Tire Corporation, Portland, Oregon, which did not expect to start its plant for five or six months, is now able to announce that it will have the first unit of reinforced concrete, 90 by 335 feet, in operation by the end of the present year. High-grade cord and fabric tires, as also tubes and solid tires, will be manufactured. The company has an 8-acre tract at the junction of Columbia Boulevard and the Oregon & Washington Railroad.

As bearing upon tire sales prospects it is stated that the registration of motor vehicles in Oregon on August 1, 1921, was 109,300, as compared with 103,418 December 31, 1920.

Tire dealers in the Northwest attach no small importance to the great crops this year. The fruit crop in Yakima Valley, Washington, totals over $50,000,000 as compared with Alaska's $22,000,000 maximum of gold.

RUBBER TRADE INQUIRIES

THE inquiries that follow have already been answered; nevertheless they are of interest not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The Editor is therefore glad to have those interested communicate with him.

(918) An inquirer desires the address of a manufacturer of rubber flowers.

(919) A manufacturer requests the addresses of concerns making bias-woven fabric.

(920) A reader desires prices and samples of gossamer cloth.

(921) A manufacturer asks where he can obtain carbonaceous clay and piperidine-piperidyl-dithiocarbamate.

(922) Information is desired concerning methods of making daily tests of curing solutions for dipped goods.

(923) A reader asks for data on methods of reclaiming gasoline from the dipping room.

(924) A manufacturer requests the addresses of manufacturers of diphenylguanidine.

(925) An inquiry has been received for the names of manufacturers of machines for auto tire bead cutting, tread pulling, and skiving.

(926) A reader desires the addresses of concerns that can supply linemen's rubber aprons to withstand electric voltage of 15,000 volts.

(927) Request is made for the names of articles or books dealing with the chemistry and manufacture of chewing gum.

(928) A manufacturer wishes the address of the manufacturer of a machine to grind cotton linters or of a concern that will grind linters on a poundage basis.

(929) A reader asks for the addresses of manufacturers of machinery for the manufacture of chewing gum.

(930) Inquiry is made for the addresses of manufacturers of rubber reducing garments.

(931) A reader desires the address of a concern that can supply improved apparatus for testing air-brake hose in accordance with Master Car Builders' Association specifications.

TRADE OPPORTUNITIES FROM CONSULAR REPORTS

Address may be obtained from the Bureau of Foreign and Domestic Commerce, Washington, D. C., or from the following district or cooperative offices. Requests for each address should be on a separate sheet and state number.

DISTRICT OFFICES.	COOPERATIVE OFFICES.
New York: 734 Customhouse.	Cleveland: Chamber of Commerce.
Boston: 1801 Customhouse.	Cincinnati: Chamber of Commerce; General Freight Agent, Southern Railway, 96 Ingalls Building.
Chicago: 504 Federal Building.	Dayton, Ohio; Dayton Chamber of Commerce.
St. Louis: 402 Third National Bank Building.	Los Angeles: Chamber of Commerce.
New Orleans: 1020 Hibernia Bank Building.	Philadelphia: Chamber of Commerce.
San Francisco: 307 Customhouse.	Portland, Oregon: Chamber of Commerce.
Seattle: 848 Henry Building.	

(95) A manufacturer in Mexico desires to purchase a small machine for the manufacture of chewing gum. Cash with order. Correspond in Spanish.

(115) A manufacturer in Chile desires to purchase machinery belting. Quote c.i.f. Talcahuano.

(136) A commercial agent in the United States who has trade connections with firms in Mexico desires to secure an agency from manufacturers for the sale of tires, belting, rubber goods, electrical appliances, etc.

Activities of The Rubber Association of America

MONTHLY STATISTICS CONCERNING HARD RUBBER SALES CONSIDERED

ALL members of the Hard Rubber Division of The Rubber Association of America have been requested to express their opinions concerning participation in a plan to publish monthly statistics concerning gross sales of hard rubber goods. The plans contemplated are similar to those already in operation in connection with the Tire Manufacturers' Division, the Mechanical Rubber Goods Manufacturers' Division, and the Rubber Proofers' Division. The suggestion, if put into operation, will be conducted under a code system, which will preclude the possibility of the information becoming public property.

FIRE HOSE SPECIFICATIONS PREPARED BY BUREAU OF STANDARDS

Specifications concerning rubber-lined cotton fire hose have been so revised by the Bureau of Standards that they are now acceptable to the Specification Committee of the Mechanical Rubber Goods Manufacturers' Division. The specifications have been printed and are now ready for distribution to those interested.

ACCOUNTING COMMITTEE ORGANIZED

At a recent meeting of the newly appointed Cost Accounting Committee it was decided to broaden the scope of the work to include not only cost study, but all phases of accounting. It was believed that many accounting problems which would occur could be most effectively dealt with by a cooperative body, and that the personnel of the original cost accounting committee should be increased. Hereafter this body will be known as the "Accounting Committee."

Arrangements have been made for each member to prepare a memorandum outlining the functions of the cost accounting department in his company and its relation to the enterprise as a whole; the definition of factory cost, with a classification of the burden and other elements entering into factory cost; and the underlying principles covering the application of factory burden; this work to be in anticipation of an early meeting of the Committee for discussion of specific problems.

LEGISLATION AFFECTING THE TIRE INDUSTRY

The frequency with which new legislation adversely affecting the tire industry is proposed by state legislatures makes it desirable that any legislative action of interest to the tire industry should be reported. Consequently, the Executive Committee of the Tire Manufacturers' Division recommends that all members of the Division instruct each field representative to closely watch and report on legislative conditions in his locality, the report to be made either to his home office or to this Association.

STATISTICS COMPILED FROM QUESTIONNAIRE COVERING THE FIRST SIX MONTHS OF 1921[1]

	Reported by Manufacturers who also Reclaim (30)	Reported by Reclaimers Solely (8)	Total
Reclaimed rubber produced from raw and cured scrap.....*pounds*	14,709,461	18,817,845	33,527,306
Scrap rubber (including raw and cured scrap) consumed in production of reclaimed rubber, *pounds*	20,074,215	25,595,209	45,669,424

NUMBER OF POUNDS OF CRUDE RUBBER CONSUMED IN THE MANUFACTURE OF RUBBER PRODUCTS AND TOTAL SALES VALUE OF SHIPMENTS OF MANUFACTURED RUBBER PRODUCTS

Product	Number of Pounds Crude Rubber Used	Total Sales Value of Shipments of Manufactured Rubber Products
Tires and Tire Sundries:		
Automobile and motor truck pneumatic casings	75,863,102	$186,898,873
Automobile and motor truck pneumatic tubes	18,025,602	24,776,850
Motorcycle tires (casings and tubes)	154,548	585,876
Bicycle tires (single tubes, casings and tubes)	480,964	1,512,985
All other pneumatic casings and tubes, not elsewhere specified	1,014,140	2,022,778
Solid tires for motor vehicles	6,395,213	9,919,532
All other solid tires	120,884	459,475
Tire sundries and repair materials	1,845,488	5,306,236
Total—Tires and tire sundries	103,889,941	$231,482,605
Other rubber products:		
Mechanical rubber goods	11,020,417	$34,475,894
Boots and shoes	10,254,260	41,386,097
Insulated wire and insulating compounds	771,178	4,453,754
Druggists' sundries, medical and surgical rubber goods	1,285,438	5,245,416
Waterproof cloth, clothing, and rubber sheeting	1,439,175	5,524,199
Hard rubber goods	852,593	2,008,626
Miscellaneous, not included in any of above items	2,456,359	6,741,283
Total—Other rubber products	28,079,420	99,835,269
Grand total—All products	131,979,361	$331,317,874

INVENTORY OF CRUDE RUBBER IN THE UNITED STATES AND AFLOAT FOR U. S. PORTS, JULY 31, 1921

On Hand	Long Tons
Importers and dealers	15,030
Manufacturers	58,188
Total on hand	73,218
Afloat	**Long Tons**
For manufacturers and importers and dealers	24,352

[1] The number of rubber manufacturers reporting data for the first half of 1921 was 239, plus 94 (see note); the number of crude rubber importers and dealers reporting data was 56; and the number of reclaimers (solely) reporting data was 8. The total daily average number of employes, on basis of third week of January, 1921, was 110,104.

Important Note—In additon to the 239 firms who actually supplied data, the questionnaire developed that a total of 94 companies recently listed as rubber manufacturers are either out of business or are jobbers of rubber articles. Consequently this compilation may be considered as embracing 333 companies.

REPORT OF INVENTORY—PRODUCTION—DOMESTIC SHIPMENTS OF PNEUMATIC CASINGS—INNER TUBES—SOLID TIRES.. ETC.

November, 1920, to and including August, 1921

Month	Pneumatic Casings				Inner Tubes				Solid Tires			
	No. Mfrs. Reporting	Inventory	Production	Shipments	No. Mfrs. Reporting	Inventory	Production	Shipments	No. Mfrs. Reporting	Inventory	Production	Shipments
November, 1920	36	5,880,016	649,742	806,023	40	6,131,935	742,815	920,938	11	298,875	21,355	34,217
December, 1920	43	5,508,380	506,111	1,327,153	43	5,786,929	508,446	1,481,285	12	303,473	16,297	40,828
January, 1921	45	5,319,605	703,430	965,417	47	5,586,163	740,824	1,042,617	12	303,753	21,220	29,116
February, 1921	45	5,193,018	819,892	1,073,756	46	5,415,464	916,627	1,129,881	12	304,374	23,365	29,599
March, 1921	46	4,597,103	1,163,314	1,614,651	48	5,044,861	1,346,483	1,643,690	12	283,800	28,710	43,926
April, 1921	49	4,527,445	1,651,418	1,785,951	51	4,916,772	1,762,122	1,983,571	12	269,985	28,859	42,080
May, 1921	59	4,451,668	2,100,917	2,085,882	57	4,751,880	2,210,040	2,342,567	12	264,633	35,156	40,122
June, 1921	63	4,154,456	2,313,265	2,643,850	60	3,835,098	2,359,928	3,232,673	11	240,336	28,395	49,867
July, 1921	36	3,892,037	2,570,524	2,757,581	61	3,122,815	3,020,981	3,603,248	11	220,003	35,123	55,678
August, 1921	66	3,934,583	3,043,187	2,894,442	64	3,649,319	4,430,152	3,804,060	11	216,367	55,694	66,866

"Production" and "Shipments" figures cover the entire month for which each report is made. "Inventory" is reported as of the last day of each month.
"Inventory" includes tires and tubes constituting domestic stock in factory and in transit to, or at, warehouses, branches (if any) or in possession of dealers on consignment basis, and as a total represents all tires and tubes still owned by manufacturers as a domestic stock.
"Shipments" includes only stock forwarded to a *purchaser* and does not include stock forwarded to a warehouse, branch, or on a consignment basis, or abroad.

Compiled by The Rubber Association of America, Inc.

JUDICIAL DECISIONS

LOUIS DEF. MUNGER VS. PERLMAN RIM CORPORATION. District Court of the United States. Southern District of New York. In equity. No. 13-369.

Further developments in the litigation between Louis deF. Munger and the Perlman Rim Corporation, which has been in the courts for a number of years and has been watched with interest by tire rim manufacturers, have resulted in favor of Munger unless something new develops. The earlier proceedings were reviewed in THE INDIA RUBBER WORLD, December 1, 1917, page 161.

In the present case, the United States District Court in New York City entered a decree in favor of the plaintiff for $73,070.08, with interest from the date of the Master's report, and for costs. An appeal was taken from the decree to the United States Circuit Court of Appeals for the Second Circuit and, after argument in that court, the decree was modified by that court by reducing the judgment to $48,713.39, with interest and costs. Otherwise the decree was affirmed.

The defendant then made a motion for reargument of the case before the Court of Appeals and the reargument was denied.

A final decree was then entered by the United States District Court against the defendant for the reduced amount of $48,713.39 with interest and costs.

The first Monday of October, 1921, the defendant presented to the United States Supreme Court a petition for a writ requiring the case to be sent to that court. That petition is now pending in the Supreme Court and is likely to be disposed of by the judicial body at an early date. No hearing is given on such a petition. If it should be denied, there can be no further proceedings on the part of the defendant.

The defendant, Perlman Rim Corporation, was dissolved and all of its assets were transferred to the United Motors Co. during this litigation, and thereafter the United Motors Co. was dissolved and its assets were transferred to General Motors Corporation. The United Motors Co. assumed the liabilities and obligations of Perlman Rim Corporation and General Motors Corporation assumed the liabilities and obligations of the United Motors Co. There will probably be proceedings against General Motors Corporation for the recovery of the judgment in this suit.

Hudson Tire Co., Inc., vs. Hudson Tire & Rubber Corporation. Federal District Court, October 7, 1921.

In a suit recently instituted in the Federal District Court by the Hudson Tire Co., Inc., against the Hudson Tire & Rubber Corporation, the case was decided in favor of the plaintiff. The Hudson Tire Co., Inc., 36 William street, Newark, New Jersey, claimed that, since its establishment in 1915, another company had been placing upon the market automobile tires bearing a name similar to the original manufacturer's. In deciding the case it was held that the Hudson Tire & Rubber Corporation, established in New York State in 1920, had no claim to a name previously used and which had acquired significance as indicating the plaintiff's business.

GENERAL APPRAISERS' DECISIONS

Several cases in regard to the proper classification of chewing gum, and various crude gums known as cauchillo, perillo, and sande, have been recently decided by the Board of General Appraisers. A few of these decisions were based on paragraph 36, Tariff Act of 1913, where chicle is claimed dutiable at 15 cents a pound, while others came under paragraph 385, the merchandise dutiable at 10 per cent ad valorem. The latter opinion, for instance, was sustained, in the case of William Wrigley, Jr., Co., following a former Treasury Decision No. 38689, in Rubber Association vs. United States—*Treasury Decisions*, Volume 40, No. 11, pages 6 and 7; No. 13, pages 12 and 14.

Protest 935787 of Davies, Turner & Co., New York, N. Y., PRINTERS' BLANKETS OF COTTON AND RUBBER. The claim was made that the merchandise was composed chiefly of rubber, and therefore dutiable at 10 per cent under paragraph 368, Tariff Act of 1913. It was decided, however, with former cases as precedents, that when the cotton and rubber are in condition to be united to form the blankets the cotton is more valuable than the rubber. The goods therefore were held as dutiable as manufactures in chief value of cotton at 30 per cent ad valorem under paragraph 266.—*Treasury Decisions*, Volume 40, No. 13, page 14.

Protest 937288-62815 of G. W. Sheldon & Co., Chicago, Illinois, RUBBER SOLES AND HEELS. The claim that such articles were dutiable as manufactures of india rubber at 10 per cent, under paragraph 368, was not sustained. As metal was not one of the component materials, and the Government conceding that rubber is of chief value in the articles in question, they were held as properly classified under paragraph 256. By this ruling, and under the Tariff Act of 1913, soles and heels made of cotton and rubber are considered as wearing apparel, duitable at 30 per cent lack of invention.—*Federal Reporter*, Volume 272, page 901.

ADJUDICATED PATENTS

McLEOD TIRE CORPORATION VS. B. F. GOODRICH CO., United States District Court, New York.

The McLeod patent for cord tire, No. 1,029,307, held void for lack of invention.—Federal Reporter, Volume 272, page 901.

THE EDITOR'S BOOK TABLE

"PEEPS AT INDUSTRIES—RUBBER." BY EDITH A. BROWNE, F. R. G. S. A. & C. Black, Limited, 4, 5 and 6 Soho Square, London, W. 1, England. Second Edition. Paper, illustrated, 88 pages, 5 by 8 inches.

ONE of the volumes in a series known as "Peeps At Industries" aims to present, in a popular style, the whole story of the development of the rubber industry, although no attempts are made to describe factory operations in the manufacture of the finished product, in America or elsewhere. Suggestive titles of chapters are "The Romance of Rubber," "Life on a Rubber Plantation," and "Making Pará Rubber in the Forest." Two chapters are devoted to describing the different kinds of wild rubber, while another is entitled "Products Kindred to Rubber." The volume has many excellent illustrations, and is published in this country by The Macmillan Co., 64-66 Fifth avenue, New York, N. Y.

"DESIGN AND MANUFACTURE OF PNEUMATIC MOTOR TYRES." By Colin Macbeth. Published by the Institution of Automobile Engineers, 28 Victoria street, London, S. W. Paper, 83 pages, 5 by 8¼ inches.

This is a reprint of a comprehensive paper by Colin Macbeth of the Dunlop Rubber Co., Limited, Birmingham, England, read before the Institution of Automobile Engineers, February, 1921. Mr. Macbeth covers the subject exhaustively in its every feature. The paper is illustrated by numerous illustrations and diagrams, and is followed by several pages of discussion by other engineers.

NEW TRADE PUBLICATIONS

DAVID BRIDGE & CO., LIMITED, CASTLETON, MANCHESJER, England, has issued for the information of manufacturers of rubber, gutta-percha, balata, celluloid, casein and other plastic products, a very handsomely printed cloth-bound catalog of 136 pages showing their complete line of machines. The text is alternately in English and French. The illustrations, reproduced from photographs, convey a clear idea of each machine. This catalog should be in the library of every rubber superintendent.

THE L. E. KNOTT APPARATUS CO., BOSTON, MASSACHUSETTS, has for distribution its catalog 26c, covering the usual field of chemical and biological laboratory apparatus

IN THE FALL ISSUE OF *The Davol Drummer* AN ATTRACTIVE illustrated circular prepared by the Davol Rubber Co., Providence, Rhode Island, the leading feature, aside from the company's many products advertised, is an article entitled "Some Trade Abuses," written by P. R. Wesley, the company's general manager. The article was originally printed in *The Druggists' Circular*.

CHAT NO. 7, ON "THE BLACK ART OF RUBBER COMPOUNDING," has been issued by Binney & Smith Co., 81 Fulton street, New York. The present number concludes the series in which the role of the company's special products in the newer school of rubber compounding has been set forth.

THE CHEMICAL RUBBER CO., CLEVELAND, OHIO, SPECIALIZING in scientific instruments and materials, has recently issued a catalog, listing articles manufactured by the firm, with current prices. Among these articles are reagent chemicals and stains, laboratory porcelain and glass, microscopical equipment, balances, hotplates and electric furnaces. This company, which publishes "The Hand Book of Chemistry and Physics," claims to supply "anything and everything for the rubber laboratory."

THE FOURTEENTH ANNUAL EDITION OF THE "SPORTING GOODS TRADE DIRECTORY," a publication prepared by Charles C. Spink & Son, St. Louis, Missouri, has been recently issued. This classified index appears to have arranged, under subject headings, the names of manufacturers of all varieties of sporting goods, while a second list includes a geographical arrangement of the names of sporting goods jobbers throughout this country and Canada. Following their usual custom the publishers of this directory will send a copy of this publication to each subscriber to *The Sporting Goods Dealer*.

THE YEAR BOOK OF THE MERCHANTS' ASSOCIATION OF NEW York, 1921, just issued, covers the activities of the Association from May 1, 1920, to April 30, 1921. In this publication appear the twenty-third annual report of the president, the names of members, and the reports of various bureaus and committees, as well as many other items of interest. The organization as a whole aims to represent fairly the commercial and industrial interests of New York City, and to achieve results that are impossible for individuals working separately. A list of association members includes about sixty of the leading rubber manufacturers of New York, N. Y.

BY MEANS OF ABSTRACTS FROM SIX HUNDRED LEADING Magazines *The Industrial Digest* attempts to give its readers accurate and up-to-date information regarding developments in the various industries. In a recent issue, and in a department devoted to the rubber industry, extended quotations have been made from THE INDIA RUBBER WORLD. Offices of *The Industrial Digest*, a semi-monthly, are at 25 West 45th street, New York, N. Y.

CHEMICAL SERVICE TO THE RUBBER TRADE

The importance of organic vulcanization accelerators in the rubber industry has led the National Aniline Co. to establish a rubber research laboratory in charge of a rubber chemist for the study of vulcanization problems and the correct use of accelerators. Cooperation and advice on such problems is thus made available both to rubber manufacturers who have their own technical laboratories and those who do not.

Uniformity and standardization of organic compounds are of vital importance to the rubber chemist and the new laboratory here noted will insure such products and afford help through its analytic and constructive service. For example, valuable help can be given in properly balancing the curing properties of the various rubber compounds embodied in tire construction to secure correct and uniform vulcanization in the finished tire.

The improvement in vulcanization, quality and finished product made possible by such a service justifies its introduction as a new factor in the industry.

THE OBITUARY RECORD

DEATH OF JOHN B. DUNLOP REPORTED

THE death of John Boyd Dunlop, pioneer tire inventor, was reported as this issue was going to press. Mr. Dunlop was 81 years of age. A complete obituary of Mr. Dunlop will be published in the forthcoming issue of THE INDIA RUBBER WORLD.

LONG IN THE NEW ENGLAND RUBBER TRADE

H. U. True, manager of the Boston, Massachusettes, branch of the Manhattan Rubber Manufacturing Co., Passaic, New Jersey, who died last July, was born in Yarmouth, Maine. He came to Boston about thirty-five years ago with nothing behind or before him save a determination to succeed. For the past twenty-five years he has been closely associated with the rubber trade in New England. Since 1908 he was manager of the Boston branch of the Manhattan Rubber Manufacturing Co., where he fulfilled his determination to succeed, and at the time of his death was one of the most widely-known, best-liked and most successful men in the mechanical rubber trade in New England.

A PIONEER TIRE MAN

Press notices report the recent death of Franz O. Nelson, a pioneer in the tire industry of the Pacific Coast. For eleven years Mr. Nelson was the first district manager at Los Angeles of the Diamond Rubber Co., an organization later absorbed by The B. F. Goodrich Co. Later Mr. Nelson became a member of the firm of Nelson & Price, an establishment known as the largest retail tire distributing concern of the West. Four years ago, because of ill health, Mr. Nelson retired from active business, retaining, however, a stock interest in the firm. He is survived by his widow and two sons.

COLONEL COLT'S WILL CONTESTED

The announcement made a few days after the filing of the will of the late Colonel Samuel P. Colt, that serious questions had arisen as to the interpretation of the section granting bequests to certain of the employes of the Industrial Trust Co. of Providence, has been followed by an appeal being filed in the Superior Court against the probation of the will. The appeal has been filed on behalf of Russell G. Colt, Mamaroneck, New York, and Roswell C. Colt, New York, N. Y., sons of Colonel Colt, alleging that the father was not of sound and disposing mind when his will was executed; that undue influence was brought to bear; and that it was not his last will and testament.

AUTOMOTIVE EQUIPMENT ASSOCIATION TO HOLD SHOW AND CONVENTION IN CHICAGO

The Automotive Equipment Show, which will be held in Chicago, November 14 to 19, inclusive, is for the exclusive use of manufacturing members of the organization to display the merchandise they produce. Only dealers, jobbers and manufacturers interested in the automotive equipment industry will be admitted. The annual convention will be held at the same time, and plans for an interesting program have been completed.

REPORTED MERGER OF ASBESTOS CONCERNS

Press reports state that the General Asbestos & Rubber Co., Charleston, South Carolina, has been merged with the Raybestos Co., Bridgeport, Connecticut. The General Asbestos & Rubber Co., which specializes in "Garco" products, is said to be the largest manufacturer of asbestos textiles in the United States, and the Raybestos Co., the largest producer of finished asbestos goods.

Rubber Trade in Great Britain

By Our Regular Correspondent

THERE is a more healthy tone manifesting itself in trade circles and there is no doubt that business is surely, though slowly, improving. Testimony is borne to this by the unemployment figures in the trade which from 25 per cent at the end of June fell to 12 per cent at the end of August. These figures, of course, refer to total unemployment; it does not mean that all the others who are employed are working full time.

There has been quite a spurt in the proofing branch, though the business has been mostly of a hand to mouth nature. Black surface proofings for water proof retain their popularity of the last few years and several firms are busy with them. Twenty or thirty years ago only one or two firms could do this class of work satisfactorily. Now, however, the procedure, which has to be carefully followed, is pretty generally known in the trade.

The advance in the cotton market has come as a boon to the cloth dealers with large stocks still on hand, as it has enabled them to effect a considerable clearance. The rubber-faced card cloth trade would seem to be almost alone in having been practically unaffected by the slump, full time not having been departed from. The loss of the Russian and Polish markets, owing to circumstances which hardly need mention, has been counterbalanced by the heavy demands from France, Italy and indeed practically all textile manufacturing centers.

The price of Brazilian fine Pará has, of course, been very satisfactory, but against this has to be set the fact that most makers were well booked up with cotton and woolen fabric before the slump in prices took place and are not therefore in a position to cut prices to the extent that their customers would like.

AN UNLUCKY DEAL IN RUBBER

A large mutual benefit trading society, the Wholesale Cooperative Society, commonly known as the C. W. S., has sustained a serious loss of approximately £1,000,000 in connection with the fall in the price of rubber. Three-fourths of the loss falls upon the English branch at Manchester and one-fourth on the Scottish branch, of Glasgow. It appears that, dissatisfied with the opportunities for securing tea supplies at the Mincing Lane market for their 4,500,000 members, the directors decided to embark on tea plantations in India and Ceylon. About 49,000 acres were obtained, suitable for rubber and tea. A speculative first purchase of some rubber stocks turned out a success. A later deal, however, has resulted in the loss mentioned above. The matter has excited a good deal of interest among the members, as nothing was known about the new development.

It should be understood that the loss has been increased jointly on tea and rubber and out of nine estates in Ceylon owned by the Society, only one, the Denmark, is laid out in rubber alone. Regarding the estates generally, only about one-fifth of the entire cultivated area is in rubber. The view of the matter held in Mincing Lane is summed up in the words of the head of a leading firm. "We cannot see where the right of the Society exists to venture upon rubber enterprises, crude rubber not being an article of direct consumption."

FINANCIAL NOTES

The Leyland and Birmingham Rubber Co., Limited, has had a good run of prosperity during the last twenty-three or twenty-four years, but the trend of events in the financial year ended last June has caused it to lose £20,014 after providing for depreciation, but also reckoning in the estimated amount of excess profits duty which is recoverable. As a result the ordinary shareholders receive no dividend against 15 per cent for the last two years. As the leading profit last year was £86,400, the set-back which has occurred is serious enough. At the annual meeting, Robert Byrne, the chairman, said he thought the reason for the loss of profit would be obvious to most of the shareholders. On top of the sudden slump in trade, which was world-wide, and largely reduced the values of stocks, they had the disastrous coal strike. Not only had they to pay greatly increased prices for what coal they could get, but eventually they had to close down altogether. Reference was made to the South American branch in Buenos Aires, which was visited by J. T. Goudie this year. Mr. Byrne went on to reiterate what he had said on former recent occasions as to the necessity for an improvement in output so that the high cost of production could be reduced. Unless they got better working conditions from the people, he said, he did not see how the country's trade was going to be increased.

J. Mandleberg & Co., Limited, has declared interim dividends of 10 per cent on the ordinary shares and 8 per cent on the preference shares, the same as last year. As was anticipated, the directors announce that trading has been unsatisfactory, but the substantial carry-over and reserve fund warrant the payment of these dividends.

THE INSTITUTION OF RUBBER INDUSTRY

The Rubber Club of Great Britain has at the last moment before coming definitely into being changed its title to that of "The Institution of Rubber Industry" and will now come in line with other institutions of recent formation, such as the Textile Institute, the Institute of Metals, etc. The president is J. H. C. Brooking; vice-president, Ashley B. Cook, and secretary, Walter Tyson, to whom all communications should be sent at the Institution's offices, Charing Cross House, Charing Cross Road, London, W. C. 2.

The main object is to provide for the exchange of ideas among the members of the industry and to provide a common meeting ground for friendly discussion and settlement of questions affecting the well-being of the rubber industry. The institution or club will not clash with any existing organizations within the industry, but will cooperate with them wherever possible.

The proposal to provide a central club house with a well-stocked library will not materialize just at present, but meetings are to be held monthly at some convenient place in London, Manchester, Birmingham and Glasgow. The first meeting is to be held on October 18 at the Royal Society of Arts, London, when the president will give an address to be followed by Sir Henry Wickham and Herbert Rogers, of James Lyne Hancock, Limited. Various other papers have already been arranged for the London and provincial meetings of future months.

The scheme for such an institution seems well-conceived and it should be a success. With regard to the central club house, there will doubtless be many, especially provincials, who see no need for hurry about it. It is clear that the comparatively moderate subscription to be paid for the first year will have to be increased if permanent premises are to be kept up. A golf challenge cup, value 100 guineas, has been presented by J. Wallwash, of Thomas Rowley & Co., Limited, for competition by members.

An important sale of the nearly new tire plant and machinery of Oylers Limited will take place shortly at the Richmond works of this company by order of the receiver in bankruptcy.

THE MACLAREN ESTATE

W. F. Du Bois Maclaren of Clynder, Dumbartonshire, and of Maclaren & Sons, Limited, left a personal estate of the total value of £129,374. In publishing the will comment is made in some papers on a publisher's big fortune. Without wishing to suggest that publishing is not a highly profitable business, it may be taken for granted that it was the deceased's connection with many rubber and tea planting companies which produced, or at any

rate largely augmented, his fortune. It has also been stated that Mr. Maclaren founded "The India Rubber Journal," whereas, as most of those in the trade know, it was acquired by him from Herbert Standring, the founder and first proprietor.

RUBBER SHAREHOLDERS' ASSOCIATION

D. F. L. Zoorn, presiding at the first meeting in London on October 3, said that the object of the Association was to render shareholders articulate and that they should have a proper voice when decisions of vital importance to the rubber planting industry were being taken. Of course, they recognized that the crisis was just a part of the great world slump, but there was no doubt of the existence of an uneasy feeling that proposals for the better regulation of the industry were not considered purely upon their merits, but were influenced by the vested interests of those who feared that the suggested new departure might interfere with their private profits or emoluments. Propaganda with regard to the uses of rubber is to be one of the activities of the Association, as is also to be the case with the Rubber Growers' Association. One of the speakers at the meeting advocated the direct manufacture and supply of rubber goods and the chairman pointed out that this was really a matter of raising the necessary capital. Perhaps something more would be required to make it a financial success.

THE UNITED RUBBER PRODUCTS, LIMITED

Some animated discussion took place at the annual meeting held in London on October 3. Captain Underwood, who has succeeded the late Louis Alexander, founder of the company, as chairman, announced that he was working in collaboration with W. Luffsmith, who had put on the market an unburstable ball which would far excel any other. It was made by a secret process for which Mr. Luffsmith got £35,000 in shares. It appears that £70,000 had been paid for some other secret process which had proved to be worthless and it was hoped to get £20,000 back from Mr. Alexander's estate. Mr. Henshaw said he had been told by an expert that there was no secret and that anyone could make an unburstable ball if he wanted to. The position appears to be that the secret of making such balls is now known to several persons, but it is not yet widely known. The fact, however, that it is known to more than one or two, naturally reduces the market value of the process.

BUCKLETON & NOURRY

Under the firm name of Buckleton & Nourry, Ernest E. Buckleton and Alexander Nourry have begun business at 13 Rumford street, Liverpool, England. The new company will deal in raw and reclaimed rubber.

Mr. Buckleton is well known in the rubber industry, both in England and in the United States. In this country he was connected for several years with the Revere Rubber Co., the Boston Woven Hose & Rubber Co., and the Joseph Stokes Rubber Co. Following this he became, in Liverpool, England, general manager, and finally president of the Northwestern Rubber Co., Limited. Mr. Buckleton was a captain in the World War, and, in recognition of his services, has been recently decorated by the Belgian King.

PLAN FOR FORMING RUBBER PRODUCERS' CORPORATION ABANDONED

Failing to secure a two-thirds majority of rubber producers, or the support of the Government in their proposed scheme of restriction, the upholders of the plan for the formation of a Rubber Producers' Corporation have been compelled to abandon their undertaking. The members of the Council are, it is stated, alive to the importance of enlarging the channels for the consumption of rubber and have used and will continue to use their best endeavors to achieve this end, but they remain of the opinion that it is disastrous to continue to produce rubber which can only be sold at less than cost of production. Approval of the scheme proposed was expressed by holders of 769,306 acres planted to rubber out of a total area representing 3,323,000 such acres.

THE RUBBER TRADE IN EUROPE

By Our Regular Correspondent

FRANCE

THE 1920 report of the Société Commerciale du Caoutchouc shows that although the company had to suffer from the world crisis, conditions are nevertheless satisfactory. With the aim of reducing to a minimum the overhead expenses, the chief warehouses have been transferred to the stores at the Plaine-Saint-Denis.

The total balance is 4,543,246 francs; funds available are 1,726,943 francs and the various debit accounts, 1,331,250 francs. The last sum includes participation in other business, chiefly in a reclaiming plant in Belgium. The available assets were 3,058,193 francs in 1920, compared with 3,390,447 francs the year before. As a drop in the prices of waste was foreseen, the present stock was bought at reasonable prices so that when the inventory was made, a very slight lowering of the value of this stock brought prices to the level of prevailing rates. The net profits amounted to 870,863 francs and the gross dividend was 8 francs per share. The shares are valued at 112 and this is considered satisfactory.

While the French factories and the Italian branch of the Etablissements Hutchinson feel the effects of the present crisis, the factory in Mannheim, Germany, is working at full capacity. This factory was restored to the company at the beginning of March, 1920. New agencies have been created at Tours, Bourges and Casablanca. The company has 25 branches in France, Algiers, Morocco, England, Belgium, Switzerland and Spain.

The electrical concern, Etablissements Grammont, has had a satisfactory year. The company was able to reduce excess stock in time, having set about this task as soon as the first symptoms of business depression were felt. New and important installations have been added and the capacity of its main factory has been raised to the level of its most serious competitors. The amount of business for the year totaled 150,000,000 francs, an increase of 40 per cent over that for the previous year. The financial situation is good; available assets are 72,000,000 francs against liabilities of 33,000,000 francs. The net profits were 3,213,092 francs against 2,055,384 francs in 1919-20 and 1,011,688 francs for 1918-19. The dividend was fixed at 40 francs for A shares and 20 francs for B shares.

Important changes in the organization of the French Pirelli concern have recently been announced. The main offices have been transferred to Levallois-Perret, and sales of Pirelli products including cables, electric conductors, insulating materials, pneumatic and solid tires and various rubber articles, will be extended throughout France. This increased field of activity has resulted in the creation of a general management of which Philippe Frangialli, who has been connected with the Pirelli firm for many years, will temporarily take charge. Leon Chamolt is chief of the pneumatic and solid tire sales department. Albert Maury, who has managed the French company since its foundation, has resigned and will take up the direction of another firm.

NORWAY

From September 4 to September 11, a fair was held in Christiania and several rubber goods manufacturers were represented. First, there was the A. S. Den Norske Galosche- & Gummivarefabrik, Mjöndalen. The factory was destroyed by fire in 1919, but has since been rebuilt. Before the fire, 208 hands were employed. At present, the number of employes is 128. The firm specializes in rubber footwear, then jar rings and packing.

The Askim Gummivarefabrik, Askim, and the Brohahls Gummivarefabrik, Drammen, were also represented. Besides these there

were the raincoat factory, A. S. Herkules Konfektionsfabriker, Christiania; and Braasted & Co., A.-S., Christiania, and Lars Hansen of Kristianssund N, both of which firms also exhibited raincoats. The Norske Kaabefabrik A.-S., Christiania, exhibited electrical wires and cables.

SWEDEN

The firm of O. Johnson & Co., Stockholm, which hitherto made only automobile accessories has now added the following departments to its factory: fire-fighting apparatus, technical and surgical rubber goods, medical and laboratory glasses and outfits, rubber coats, toys and haberdashery.

About 300 employes of the Ryska Gummifabriken A.-B., Malmö, refused to work under the firm's new wage scale.

AUSTRIA

The Vienna Fair, although not a financial success, is important as being the first definite step toward reconstruction in Austria. For Germany and Austria it holds out hopes of a direct road to trade in the Orient, and under the circumstances Vienna and the fair are getting their share of attention.

About 40,000 persons attended the fair where, among other exhibits, rubber goods were seen. These comprised surgical goods, druggists' sundries, hard and soft rubber goods, sporting goods and toys. The qualities were good, but there were few sales, so that many firms did not even make enough to cover their expenses. Among the old firms represented were, G. Schneider, G. m. b. H., and Ernst Pietsch, and of the newer concerns, "Primeros" and "Guwak," all of Vienna.

GERMANY

After all that has been written and said about Germany's successful initial attempts to recapture her former trade, the average foreigner pictures to himself the German manufacturer and merchant gleefully rubbing their hands and jocosely asking, "Who won the war?" But the same foreigner would be surprised to notice the degree of pessimism prevailing in certain circles. Thus the *Gummi-Zeitung* of September 23, remarks in an article on the present situation that German economic affairs are passing through an unparalleled crisis.

The two factors mainly responsible for this condition are the rate of the mark and the policy of foreign countries with regard to Germany. The low value of the mark, while favorable to export trade, is the reverse as regards import business. In fact, the low rate has caused prices of necessary imports like rubber, cotton, asbestos, fats and oils to rise so alarmingly that local manufacturers have had to raise prices considerably. Manufacturers of gutta percha and balata-gutta percha have been raised at least 30 per cent; rubberized fabrics now average 10 per cent higher and will probably be higher still, as the increased cost of the raw materials is in some instances 30 and 40 per cent. Standard quality packing, hose and tubing are now 15 per cent dearer; and irrigation and water tubes as well as Klingerit plates are 10 per cent higher.

Another result of the low mark has been to force companies to increase their capital considerably. Thus at the end of June, 1921, the nominal capital of the German stock companies totaled about 38 billion marks, against 14.9 billions at the end of 1914, and 20.3 billions at the end of 1919.

On the other hand, the big exporting countries of the world, as well as many smaller countries which had started new industries during the war or had assumed important positions as middlemen, have revised their tariffs and made such new regulations regarding dumping that in most cases the inducement of low prices that Germany can offer, owing to the depreciation of her currency, is inimical to her success in exporting.

If Germany thought that she would be able to overcome the difficulties in exportation, owing to the feeling roused against her during the war, by using the neutral countries, her calculations have miscarried. For the Scandinavian countries, which have large quantities of foreign goods bought for the purpose of reexportation to the Central European countries, have considerably limited imports on certain articles. Switzerland has revised her tariff upward and Spain has not only increased the duties on foreign goods, but has imposed an extra 8 per cent on goods coming from countries with a low rate of exchange. Besides this there is a surtax of 40 per cent for duties payable in gold.

Then it is said that France, England, Holland, America, Scandinavia, Italy and Spain, when they do buy from Germany, do so only to reexport these goods. In other words, it is claimed that German goods, particularly rubber goods, serve the above countries to capture new markets with, like Russia, Siberia, Japan, China, Asia, Africa, Australia, South America.

Meanwhile Germany is not losing the opportunity to investigate possible new markets. Thus a correspondent of the *Gummi-Zeitung* writes that the Caucasian state of Georgia is ready for dealing with Germany. It seems that the chances for developing new industries and consequently for the use of considerable quantities of rubber goods, are not unfavorable and German business men are advised to prepare for this market.

Another correspondent writes about the market for rubber goods in Syria. Although this country is comparatively richer than Palestine, it is behind the latter as far as industry is concerned. However, it is thought that the French, who are in control here, will change their trade policy with regard to Syria which will then rapidly develop. Meanwhile, rubber technical, sporting and surgical goods, as well as rubber toys, find a market here.

The English and Dutch are at present in the ascendant as importers of rubber goods for Syria. It seems that the Dutch buy German goods for this trade. The business language is French, and catalogs and letters should be in this language. Payments are made in advance. The Syrian merchant appears to be rather tricky so that caution is necessary. There is a duty of 11 per cent ad valorem on imports.

FAIRS AND EXHIBITIONS

Fairs and exhibitions are the order of the day. The Leipzig Fall Fair has just closed and the net result was far from satisfactory, especially as far as business in Germany itself is concerned. Foreign trade was somewhat better and this, in connection with the recognized fact that there is a certain animosity against German goods abroad, has made some people thoughtful. In some circles it is thought that it would have been wiser for the Germans to have kept to themselves their hopes concerning their export trade instead of making this evident at the Leipzig fair, and merchants are warned to be more cautious in the future for it is obvious that the foreign buyers purchase for reexportation, which of course thwarts German plans.

As for the goods shown, these were not quite up to previous standards. Sales in some articles fell off a good deal. Thus the turnover in toys was very moderate, probably owing to the fact that these are expensive, a medium quality rubber ball costing from 20 to 30 marks. Rubber sporting goods, however, went well. Of late German interest in sports has developed remarkably and many rubber manufacturers are concentrating more on sporting goods than formerly. In fact it is claimed that sales in sporting goods are ten times as high as that of rubber goods. Artificial arms, fingers, limbs, etc., were particularly well represented. The showing of rubber clothing, too, was good. There were raglan coats for women, men and children, also rubber jumper, skirts, sports blouses and, above all, rubber hats. The latter were particularly successful and came in all kinds of shapes, combinations and colors. At present hats of leather are very stylish but they are expensive and to those of moderate incon... the rubber hats, which are at least half the price of the leath... creations, make an especial appeal and are worn on all occasions.

Reports have it that the Breslau fair was successful. It appears that plans are afoot to make of this city the center of trade with the East and the citizens are willing to go to some length with this end in view. The Soviet republic was requested to open their own information bureau at the fair, as news from the press is mostly vague and contradictory. Delegates of the republic were stormed by eager enquiries concerning conditions in Russia. The Russian General Secretary, Pieper, declared that during the past year Russia had placed orders in Germany to a value of four billion marks and intended to place for two billion marks more. However, the question of payment is not yet sufficiently clear.

A German automobile and accessories exhibition was opened in Berlin on September 23.

In Kiel, a fair was also held. Through this fair, the Germans are endeavoring to make headway in the Scandinavian countries and in the Baltic states. Business at the present fair was very satisfactory and although there were not many rubber goods firms represented, rubber got a fair share of attention, especially rubber technical goods, jar rings, electrical goods, soles and heels, toys, and articles for sports. Surgical goods and druggists' sundries did not attract much attention.

ECONOMIC AGREEMENT BETWEEN ITALY AND GERMANY

A provisional agreement between Italy and Germany has just been made whereby these countries undertake to regulate and facilitate mutual trade relations. The governments of both countries will, as far as possible, remove difficulties connected with the granting of permits, for import and export trade with each other as far as certain listed articles are concerned, including solid tires and treads. This agreement is effective from September 1, 1921, and will be in force for nine months from this date. If notice to the contrary is not given by either party one month before the expiration of the contract, it will automatically be renewed for another nine months.

NEW FIRMS

Singtex Herren-Mäntel Fabrik G. m. b. H., Berlin-Schöneberg; manufacture and sale of men's coats of cloth and rubber fabrics.

Westdeutsche Gummi-Manufaktur Carl Gerhard Halfmann, Düsseldorf.

Dom Gummiwaren-Handelsgesellschaft m. b. H., Hildesheim; trade and sale of rubber goods and allied articles.

Grentz & Stankewitz, Gummisohlenverwertungsgesellschaft m. b. H., Kiel; wholesale and retail dealing in the rubber heels and soles of the firm Ottens & Mühe, Hanover; also attaching heels and soles to footwear.

Ing. von Köhler & Co., Kommandit-Gesellschaft, Kassel; manufacture of machines, tools, and molds for the rubber trade.

Sichel & Schroeder, G. m. b. H., Cologne; sale of the rubber heels of the Santo Company, Berlin, for Rheinland and Westphalia.

Denseritwerke G. m. b. H., Berlin; manufacture and sale of packing, particularly the product known by the name Denserit; also manufacture and sale of technical goods as well as of machines and apparatus for the manufacture of these. The firm has a capital of one million marks.

Union Apparatebau-Gesellschaft m. b. H., Berlin; manufacture of technical apparatus.

Bergische Sportindustrie G. m. b. H., Elberfeld; manufacture and sale of sporting goods of all kinds.

Carl Paul, Treibriemenfabrik, Gassen near Frankfort-on-the-Oder, manufacture of belting.

Gummiwarenhaus Josef Steffestun, Koblenz-Lützel.

Xylopod-Gesellschaft m. b. H., Waltershausen, Thüringen; manufacture and sale of goods made of rubber and of rubber-like materials; also of articles used in the manufacture of footwear.

Draht- und Kabelwerk Rheinland, A.-G., Dortmund; manufacture and sale of cables and wires. The capital is 500,000 marks.

Gummiwaren-Stanzwerkstätten Paul Löwenthal, Hamburg; dies.

Kautschuk-Pflanzung "Meanja" A.-G., Berlin, branch Victoria; this concern will acquire and exploit land in the German protected territory of Kamerun, and particularly the rubber plantation Meanja.

Orplid Gummi-Industrie G. m. b. H., Hanover; manufacture and sale of all kinds of rubber goods, especially of "Orplid" products.

Mittelrheinische Gummiwaren-Grosshandlung, G. m. b. H., Koblenz; wholesale dealing in rubber goods and allied articles.

Norddeutsche Gummi-Manufaktur Strelitz Alt, Strelitz, Alt.

GERMAN NOTES

The Deutsche Gummi-Regenerier-Fabrik Haas & Co., Hanover, has changed its name to Haas & Co.

The C. Muller, Gummiwarenfabrik, Aktien-Gesellschaft, Berlin-Weissensee, has increased its capital by 800,000 marks.

A big fire destroyed rubber stores of the Kabel und Gummiwarenfabrik von Dr. Cassirer & Co., Charlottenburg. A gas oven was responsible for this fire. Work was not interrupted.

At the Gummiwarenfabrik Schuster & Singer, Rosswein, Saxony, too, a fire broke out which was serious enough to stop practically all work for some time. However, all efforts are being made to restore the works completely.

SOVIET RUSSIA

There are at present seven rubber factories in Soviet Russia, but of these, only four were working during the first half of 1921 and then only at irregular intervals owing to lack of fuel. Thus the premier rubber factory in Russia formerly known as the "Treügolnik" did not get started until January 13, stopped on February 4, and did not resume activities until March 28. Conditions in the other factories that were able to work were similar.

The following table shows what the output would have been if the program had been carried out and what it actually was:

		Program	Actual output	Percentage
Rubber footwear	*pairs*	750,000	11,839	1.6
Cloth footwear	*pairs*	550,000	9,569	1.7
Tires	*number*	25,000	2,443	9.6
Jar rings	*pouds*	600	....	....
Belting	*archines*	305,000	107,309	53.2
Rubber soles	*pouds*	39,759	7,433	18.6
Ebonite sheets	*pouds*	675	83	12.3
Gas receptacles	*number*	12	2	16.6

A poud equals 36 pounds and an archine, 28 inches.

It is reported that the Moscow branch of the Treügolnik is about to undertake the manufacture of pneumatic tires and later on of rubber shoes and surgical goods. It seems that this firm has a considerable quantity of raw material at its disposal.

FOREIGN TARIFFS

AUSTRIA

FURTHER changes in the Austrian tariff laws, and which became effective July 20, 1921, advance the duties on many commodities. The American Trade Commissioner at Vienna states that the increase is not designed to protect home industry, but to yield the highest possible revenue. The following item is of interest to American rubber manufacturers: (4) Bundesgesetzblatt No. 386 contains a list of articles (marked "B") which will pay henceforth 130 times pre-war duties. This list contains the following articles which are being imported from the United States: rubber boots, high grade textiles, tires, waterproof wearing apparel, etc.

POLAND

Customs duties on certain articles are to be levied as from September 7 to November 30, according to H. M. Commercial Secretary at Warsaw. These duties are based on the customs tariff of January 10, 1920, and are payable in paper marks, three

paper marks being taken as the equivalent of one gold mark. The customs duties on most of these goods were previously temporarily suspended by an order of April last. The following items are of interest to the rubber industry:

Tariff No.	
ex 69	Asbestos in sheets, yarn and wares of asbestos.
ex 88	Rubber driving belts of all kinds; rubber tubing with or without fabric, with or without spring inside, but without external covering of metal; rubber packing; technical articles of rubber without fabric.

CEYLON

The revised preferential customs tariff of Ceylon, which became effective September 2, has been abandoned, cable reports state, and the former rates of duty apply from September 10. It was noted that under the proposed revision and among the ad valorem duties on imported foreign goods automobiles and accessories were mentioned at 30 per cent. This rate was formerly 7½ per cent.

BULGARIA

In the recently revised list of duties leviable on goods exported from Bulgaria, the following was noted as article No. 50: waste from rubber goods, old and useless for rubber boots, is taxable at 5 leva per 100 kilograms. The normal value of the lev is $0.193.

NETHERLANDS

Among articles recently made dutiable under the Netherlands Customs Tariff are the following:

	Rate of Duty, Per Cent ad Val.
Solutions of rubber in benzine, benzol, carbon disulphide or other liquids containing no alcohol or wood spirit, so-called solutions for repairing inner tubes for cycle, etc., tires, when imported in tubes, classed as "smallware"	5
When such solutions are imported in time of 0.25-kilogram or more they may be imported duty-free as being usually destined for workshops, etc.	
Gas heated vulcanizing instruments for repairing motor or cycle tires, dutiable according to the predominating material of which composed	5

THE RUBBER TRADE IN THE FAR EAST

MALAYA

APPARENTLY the task of bringing the different rubber interests to a point where they will unanimously decide upon a course of action to be carried out by all is doomed to remain fruitless. To the great disappointment of Malayan planters, it has now been learned that the Dutch East Indies are opposed to restriction, and as the one point upon which Malayan interests appear to agree is this very necessity of restriction, cooperation between the Dutch and Malaya seems barred.

It is astonishing that where, as in Malaya, most people fully realize the seriousness of the situation, there should be such an utter lack of unanimity. Self-interest, minus self-help, is obviously at the bottom of this situation. Judging from the endless number of schemes submitted to associations and to the press, most people are so much captivated by the perfection of their own pet schemes, that they are unable to settle down to discuss wholeheartedly and impartially the merits of the few really good schemes that have been offered and decide upon a joint course of action. On top of it all the general feeling seems to be that government ought to come to the rescue with some kind of legislative cure-all. If so many are convinced of the practicability of restriction, it is hard to understand the need for legislation.

At the present moment the Colonial Office is being approached from London and Malaya with separate propositions. The whole difference between the propositions is that whereas London wants a selling combination plus voluntary restriction, Malaya wants the selling combination plus restriction of exports by legislation. Of course these two propositions are causing more confusion. Under the circumstances what is a conscientious but sorely puzzled Colonial Office to do? And in the meantime rubber is selling below cost of production.

ALIENATION OF RUBBER LAND

At a recent meeting of the Federal Council the Hon. Mr. W. Duncan asked whether the government was prepared to consider:

(1) The desirability of refusing to alienate any more land for rubber cultivation for a period of three years or longer.

(2) The advisability of sending a properly qualified officer to the Netherlands Indies, the British West Indies and other tropical countries with a view to investigating the possibilities of introducing to Malaya new and profitable cultures.

In answer to the first part of the question, the reply was that government continued to alienate land for rubber cultivations, because it considers that the present condition is due to under-consumption and that rubber consumption would once more equal if not exceed the rate at which this commodity was disposed of before the world-wide depression of trade. Further, it is held that the present depression will have passed away long before any tree not yet planted can come into bearing. The policy suggested would result in driving to other countries people who are optimistic about the future of rubber. Finally, no person at present willing to introduce capital and employ labor should be turned away.

Regarding the second proposition, the Government considered that no useful purpose would be served by sending an officer on a roving commission. Useful visits had already been paid to Ceylon and Sumatra re agricultural education and oil palm cultivation. An officer was shortly going to the Netherlands East Indies and South India in connection with cinchona cultivation. Experiments were being undertaken at the experimental plantation at Serdang, also on Sapintas Estate.

IS THE SOIL OF MALAYA UNFIT FOR RUBBER?

The annual report of the Chief Secretary on the administration of the Federated Malay States for 1920 contains some rather sensational conclusions by the Director of Agriculture regarding the results of soil analyses for rubber estates. It appears from these analyses that much of the soil now carrying rubber is exceedingly poor and is losing its virginal fertility with such rapidity that artificial fertilization on a large scale will soon have to be resorted to. In many cases too the underlying subsoil is in an unhealthy condition and likely to become more so on account of the water table and the character of the subsoil water. There are no definite data to show the actual relationship between soil acidity and rubber yields, but the high order of acidity found in the majority of estate soils proves that an unhealthy condition for root development is the rule rather than the exception.

The *Planter*, discussing the matter, strongly protests against the report and complains that the original report from which the Chief Secretary quoted has not been published. It questions the correctness of the conclusions and deplores the fact that the department is as usual behindhand with its publications so that the whole report cannot be thoroughly studied and the above statements refuted. It suggests that the Department of Agriculture be called upon to furnish immediately detailed proofs in support of the conclusions, and is of opinion that the phrase "the majority of estates" is a mischievous exaggeration.

Kelway Bamber, the Ceylon Government analyst, who has had a large experience of soil analysis both in Malaya and Ceylon, interviewed by the *Ceylon Times*, stated that some of the best rubber was grown on distinctly acid soil and that rubber did not demand a rich soil.

VULCANIZING FROM LATEX

A message from Singapore, dated August 24, says that a method of vulcanizing direct from latex has been invented in Malaya. Forty-eight hours after tapping, manufactured articles are available for export. Shoe soles and ebonite have already been produced. At least the slump is arousing local enterprise which had been fed to sleep by fat dividends from rubber.

Recently it has been suggested that the Government should encourage the local manufacture of latex cups which has already been begun and many ask why Malaya should not manufacture the goods made from her own rubber.

INDIA

The Lieutenant-Governor of Burma, in the course of his address to the annual Durbar at Rangoon, stated that the local government is considering a scheme for guaranteeing advances made by the banks to firms and individuals engaged in the rubber industry. Most of the estates, in Burma are carrying on at a loss, and without government aid the money invested in them would be lost and when the market for rubber revived, it would take a long time to get them into working condition again. A number of banks are willing to make advances, subject to certain conditions, if the Government gives the necessary guaranty.

CEYLON

DUTIES

The *Ceylon Government Gazette Extraordinary* published the draft of a proposed Ordinance to amend the Customs Ordinance No. 17 of 1869. By this bill it is proposed to increase the tariff and to give preference to goods which are the growth, produce, or manufacture of countries forming part of the British Empire.

The item causing most disgust in rubber producing circles is the rubber export duty which remains at 3 rupees per 100 pounds in spite of agitation for its abolition or reduction. This is particularly embittering because tea, which is again in good shape, pays but half this amount.

On the import list we find that acetic acid and lead sheets, both of importance to the rubber grower, are now duty-free, if British products; otherwise, dutiable at 5 per cent ad valorem. The duty on these goods was 7½ per cent ad valorem whether they were of British origin or not. The tax on machine belting of British manufacture is 2½ per cent ad valorem, and if of foreign make, 10 per cent ad valorem. Automobiles, cycles and their accessories hitherto paid 7½ per cent ad valorem. According to the new schedule, the preferential rate on this class of goods will be 20 per cent ad valorem and the general rate, 30 per cent ad valorem.

"Preferential madness," says the *Times of Ceylon* in discussing the proposed taxes. "It is simply amazing to contemplate the levity with which government—for no reason that is apparent except that it seems a fine and imperialistic thing to do—lays down a challenge to tariff battle with the United States—a country which takes so much Ceylon produce . . . and what would it do tomorrow if America, on whose rubber tires it calmly proposes to impose a preferential duty, and who buys, perhaps, two-thirds of Ceylon's output of rubber, were to raise a tariff wall against Ceylon rubber and Ceylon tea? And what does it mean, anyway, by putting a duty on a manufactured article of which the raw material is one of Ceylon's staple products."

FREIGHT RATES

Freight rates to United States Atlantic ports have been increased by 10*s.* per ton of 50 cubic feet to 45*s.* and a further increase to 55*s.*, is announced to take effect from October 1.

NETHERLANDS EAST INDIES

At a meeting of the International Rubber Association, members declared themselves against further restriction. It is, therefore, questionable whether there will be cooperation with the Rubber Growers' Association.

According to a press report, the East Coast of Sumatra is practically unanimous in favor of the Rubber Growers' Association scheme. However, the East Coast will have to await results of discussion on the subject in The Hague, Holland.

As for government intervention: the Netherlands Indies Agricultural Syndicate strongly advises against it and has sent a long letter to the Director of Agriculture, Industry and Commerce in which it urges that the Government should by no means intervene for restriction or for any other plan of artificially raising the price of rubber.

In the opinion of Dr. F. W. T. Hunger of the University of Leiden, Holland, and now on a study tour through the East, nothing can be expected of government intervention, because the situation has been caused by over-planting. He further declared that rubber cultivation was better carried on on a small scale as in Java than on the big scale prevalent on the East Coast of Java. Dr. Hunger left Holland towards the end of 1920 and is returning via America.

HEVEA DISEASES IN JAVA AND SUMATRA

During 1920, brown bast did not spread and in some cases was less. Owing to the abnormally wet weather prevailing during the year many estates complained of stripe canker. In some parts dieback was noticeable, but the condition improved with the dry weather. Sporadic cases of *Fomes lignosus* and *Ustulina zonata* were also reported. On the East Coast of Sumatra, root diseases on young estates on loose grounds continue to give trouble. Mouldy rot was reported by the Central Java experiment station to be a source of danger for plantations in its district. On the West Coast of Sumatra, pink disease caused a lot of damage. *Coptotermes Gestroi* was rather common in West Java and East Coast of Sumatra.

THE NETHERLANDS GUTTA PERCHA CO.

From the report for 1920 it is learned that for the expansion of the factory at Singapore and the establishment of the First Netherlands East Indian Cable Factory at Sepandjang near Soerabaya, the sum of 1,297,598 gilders was spent. The latter will be in working order by the end of 1921 and will be thoroughly up-to-date.

As the necessary raw material for the gutta percha factory was insufficient, owing to lack of labor, the gutta percha division, which during the past few years had yielded little or no profit, was temporarily closed.

The rubber goods factory at Singapore has up to the present limited itself to the manufacture of technical goods, but in future the making of automobile tires will be energetically pushed. A complete installation for the manufacture of tires has been added.

The yield from the company's rubber plantations in Java amounted to 263,320 half kilos, as compared with 250,000 half kilos the year before. What was not used in the factory, was sold at the highest ruling prices. Factory results were nearly the same as during 1919, but the profits from the plantations fell from 200,000 gilders in 1919 to 69,000 gilders in 1920 (normal value of a gilder is 40 cents). Net profits amounted to 386,875 gilders out of which a dividend of 10 per cent was turned out on preferential shares, 10 per cent on ordinary shares and 6 per cent on other ordinary shares.

MISCELLANEOUS NOTES

At the Fifth Netherlands Annual Fair held at Utrecht, much that was exhibited at the London exhibition, recently held, was shown again in a special section for the products of the Dutch colonies. The rubber section was especially admired.

During the first quarter of 1921, Japan exported to the Netherlands East Indies insulated wires to the amount of 937 piculs (picul equals 133-1/3 pounds), value 80,859 yen (yen equals about 50 cents), as against 2,035 piculs, value 180,069 yen the year before, and 11,239 piculs, value 687,846 yen during the first three months of 1919. Rubber tires from Japan to the Netherlands East Indies totaled 1,894 piculs, value 412,144 yen for the first quarter of 1921, but 2,927 piculs, value 608,469 yen, and 1,527 piculs, value 304,578 yet, for the corresponding periods of 1920 and 1919, respectively.

THE TOTAL EXPORTS FROM THE UNITED KINGDOM WERE 5,952 tons in August, of which the United States took 2,718 tons and Germany 1,100 tons.—Rickinson.

Recent Patents Relating to Rubber

THE UNITED STATES

GRANTED AUGUST 23, 1921

NO 1,388,196 Demountable rim for tires. L. L. Perlman, New York, N. Y., assignor to General Motors Corporation, a Delaware corporation.

1,388,197 Wheel with demountable rim for tires. L. H. Perlman, New York, N. Y., assignor to General Motors Corporation, a Delaware corporation. (Original application divided.)

1,388,275 Tire gage. A. B. Low, Denver, Colo.
1,388,289 Elastic wheel with rubber cushion. E. Neely, Chicago, Ill.
1,388,350 Airless tire. C. H. Light, assignor of ⅓ each to A. May and V. L. Stamen—all of Des Moines, Ia.
1,388,380 Milking-machine teat-cup. J. A. Schmitt, Columbus, O., assignor to The Universal Milking Machine Co., an Ohio corporation.
1,388,447 Resilient tire core. W. A. Black, Perry, Ia.
1,388,529 Elastic sanitary belt. G. B. Smith, Philadelphia, Pa.
1,388,773 Rubber heel. D. Simone, Washington, D. C.
1,388,775 Supporter. A. B. Smith, Ebb, Fla.

GRANTED AUGUST 30, 1921

1,388,840 Tire shoe, etc., to protect tires for shipment or storage. E. H. Angier, Framingham, Mass.
1,388,843 Resilient tire-casing filler. L. F. Biesmeyer and O. Stocksick, Chamois, Mo.
1,388,848 Tire-display support. W. M. Carter, Jersey City, N. J., assignor to The W. F. Powers Co., New York, N. Y.
1,389,005 Tire-casing filler of solid rubber. W. M. McEwen, Chicago, Ill.
1,389,024 Pneumatic tire. N. Baldwin, East Mill Creek, Utah.
1,389,025 Tread for automobile running board. W. Bernstein, Jamaica Plain, assignor to Panther Rubber Manufacturing Co., Stoughton—both in Mass.
1,389,047 Rupture appliance with rubber pad attached to elastic band. A. L. Hatzan, Niagara Falls, Ont., Can.
1,389,093 Pneumatic-tire filler. E. F. Branen, Sr., Elgin, Ill.
1,389,123 Demountable rim for tires. W. G. Canion, Glen Burnie, Md., assignor to The National Manufacturing Co., a Maryland corporation.
1,389,129 Windshield cleaner. A. Dell, assignor of ½ to T. C. Ulmer, Germantown—both in Philadelphia, Pa.
1,389,416 Non-slip device for attaching to footwear, resembling a skate mounted on suction cups. I. G. Zertuche, Mexico, Mex.
1,389,470 Demountable rim for tires. F. Wildhaber and A. L. Warren, Nowata, Okla.
1,389,472 Resilient wheel. W. N. Allan, San Antonio, Tex.
1,389,473 Vehicle wheel with spring tire. W. N. Allan, San Antonio, Tex.
1,389,531 Male urinal bag. F. F. Riche, Troy, N. Y.

GRANTED SEPTEMBER 6, 1921

1,389,600 Truss with elastic belt. H. F. Schoenfield, Roseburg, Oreg.
1,389,655 Warning signal for tire deflation. F. E. Hafelfinger, Weehawken, N. J.
1,389,766 Pneumatic-tire protector. G. W. C. Lomb, Covington, Ky.
1,389,767 Arch supporter. W. M. Ludwig, Boston, Mass., assignor by direct and mesne assignments to Federal Arch-Lift Manufacturing Co., a Massachusetts corporation.
1,389,772 Fountain paintbrush. F. J. and A. H. Miller, Silver City, Ia.
1,389,806 Sectional tire filler. R. Ambuhl and M. Teitsch, Troy, N. Y.
1,389,815 Inner tube. R. F. Corless, College Park, Ga.
1,389,891 Cushion disk wheel. S. J. Mardis, Johnstown, Pa.
1,389,937 Demountable rim for tires. J. H. Cockbill, Oakland, Calif.
1,390,021 Cushioning device and support for vehicle frames. L. E. Clawson, San Francisco, Calif.
1,390,057 Pneumatic and cushion tire. G. W. Okey, Des Moines, Ia.
1,390,141 Demountable rim for tires. A. J. Kohanski, Chicago, Ill.
1,390,249 Puncture-closing tread strip for inner tubes. H. C. Privett, Long Beach, assignor of ½ to C. R. Privett, Burbank; 3/16 to H. E. Privett and 1/16 to H. F. Privett, Long Beach—both in California.

GRANTED SEPTEMBER 13, 1921

1,390,348 Resilient heel. E. J. Emery, Lynn, Mass.
1,390,366 Fountain pen. R. J. Mackenzie, Cambridge, assignor to Crocker Pen Co., Boston—both in Massachusetts.
1,390,462 Boot or shoe sole having both tread and arch-shaped shank vulcanized. A. T. Saunders, Chicopee, Mass., assignor to A. G. Spalding & Bros., Jersey City, N. J.
1,390,467 Tire core or filler. J. O. Smith, Cleveland, O.
1,390,474 Inflatable life-preserver. W. P. Tibbits, Charleston, S. C.
1,390,568 Pneumatic heel grip for shoes. G. Lawler, Auckland, N. Z.
1,390,610 Separable rim for tires. R. Garnett, Oakland, Calif.
1,390,701 Hose clamp. C. S. Haines, Indianapolis, Ind.
1,390,707 Dust-cap for tire valves. R. H. Henemier, New York, assignor to A. Schrader's Son, Inc., Brooklyn—both in New York.
1,390,723 Copyholder with rubber-covered rollers. E. W. Rothfus, assignor to Error-No, Inc.—both of Rochester, N. Y. (See THE INDIA RUBBER WORLD, April 1, 1921, page 504.)
1,390,832 Closure for bottles and other containers, having rubber seal. T. C. Spelling, New York, N. Y.
1,390,833 Closure for bottles and other containers. T. C. Spelling, New York, N. Y.
1,390,858 Syringe hydrometer. R. A. Amerman, assignor to Scranton Glass Instrument Co.—both of Scranton, Pa.
1,390,900 Tire-protecting tread. H. M. Fry, Johnstown, Pa.

REISSUES

15,191 Vehicle wheel with pneumatic tubes. G. S. Gallagher and G. Schadee, assignors by mesne assignments to E. G. Gallagher and A. Schadee—all of New York, N. Y. (Original No. 1,215,924, dated February 13, 1917.)

15,196 Elastic fabric. M. W. Schloss, assignor to Treo Co., Inc.—both of New York, N. Y.

GRANTED SEPTEMBER 20, 1921

1,391,000 Hydrometer. V. H. Meyer, Cleveland, O.
1,391,024 Cushioned wheel. J. E. Thebaud, assignor to S. Johnstone & Co., Inc.—both of Buffalo, N. Y.
1,391,074 Cushion rim for tires. E. T. Phelan, Jackson, Mich.
1,391,100 Hygienic garter and supporter. M. E. Dell, Glendale, Calif.
1,391,151 Resilient tire, flattened arch formation. J. S. Williams, Riverton, N. J. (Original application divided.)
1,391,228 Tire-valve compressor. C. B. Webster, Fall River, Mass.
1,391,267 Fountain pen with two reservoirs, two pens, etc. N. H. A. Nelson, Flint, Mich.
1,391,278 Resilient wheel with pneumatic tube around hub. R. Scheel, Dixon, Calif.
1,391,282 Fountain brush. P. A. Stephens, St. Louis, Mo.
1,391,407 Pneumatic wheel with inflatable tube between felloe and hub. J. W. Ricketts, Detroit, Mich.
1,391,412 Auxiliary tread for pneumatic tires. G. F. Roth, Des Moines, Ia.
1,391,445 Cushion wheel. J. Baeumle, Milwaukee, Wis.
1,391,472 Sectional rim for tires. M. W. Grigsby, East Peoria, Ill.
1,391,482 Spreader for pneumatic tires. H. P. Kraft, Ridgewood, N. J.
1,391,483 Spreader for pneumatic tires. H. P. Kraft, Ridgewood, N. J.
1,391,513 Tire alarm. O. F. Schroeder, Santa Ana, Calif.
1,391,541 Tire having small pneumatic inner tube adjacent to the bead, filled with cotton, etc. J. A. Grant, Atlanta, Ga.
1,391,563 Abdominal belt with elastic straps. H. A. Monin, St. Denis, France.
1,391,606 Syringe. T. W. Blakeslee, Erie, Pa.
1,391,650 Infant's combined table and bath-tub on folding legs. H. G. Truesdell and M. H. Van Wormer, Suffield, Conn.
1,391,655 Horseshoe pad. E. Sinfield and W. H. Goldfinch, assignors of ½ to A. W. Capener—all of London, Eng.

REISSUES

15,201 Repair patch for rubber footwear. J. Robertson, Jr., Weehawken, N. J. (Original No. 1,354,846, dated October 5, 1920.)

THE DOMINION OF CANADA

GRANTED AUGUST 9, 1921

212,811 Pneumatic tire. C. H. Hamilton, Homelands, Strete, near Dartmouth, South Devon, Eng.
212,822 Fountain pen. A. C. Rader, Alta, Ia., U. S. A.
212,836 Separable rim for tires.

GRANTED AUGUST 16, 1921

212,933 Swimming glove. M. Schreiner, New York City, New York, U. S. A.
212,993 Corset with elastic tension strap. The Kops Brothers Limited of Canada, Toronto, Ont., assignee of D. Kops, New York, New York, U. S. A.

GRANTED AUGUST 30, 1921

213,122 Demountable rim for tires. W. J. Bruce, Escanaba, Mich., U. S. A.

GRANTED SEPTEMBER 6, 1921

213,210 Hose supporter. E. Bettinger, Boonville, Ind., U. S. A.

THE UNITED KINGDOM

PUBLISHED AUGUST 31, 1921

165,827 Tire interliner. J. R. Bloomfield, Clarence House, Haydon Place, Guildford, Surrey.
165,895 Rotary brush with rubber or rubbershod collar, into which the bristles are fastened; for cleaning tires on self-propelled vehicles. M. L. Williams, 68 Benedict street, Bootle, Liverpool.
166,051 Sponge rubber tire core. J. H. Dalbey, 737 Douglass avenue, Elgin, Ill., U. S. A.
166,069 Gas-tight joint between valve and bush of containers of compressed air, etc., for inflating tires. W. A. and G. W. Delahey, 170 Fourth avenue, Ottawa, Ont., Can.
166,088 Armored pneumatic tire. P. Chick, Market Square, Highworth, Wiltshire.

PUBLISHED SEPTEMBER 7, 1921

166,152 Rubber tires for bassinettes, rickshaws, etc. W. C. Sneyd, 144 Bread street, Pendleton, and H. E. Young, 32 Broadway, Withington—both in Manchester.
166,432 Waterproof cape, folded within a hat, to be let down to cover the shoulders. J. R. Morris-Jones, Church Farm, Norton-in-Hales, in Market Drayton, Shropshire.
166,439 Reservoir pens. T. Kovács, 108 Lindenstrasse, Berlin.

PUBLISHED SEPTEMBER 14, 1921

166,596 Diver's dress; joint for limb members, having inside bag of rubberized fabric, etc. J. S. Peress, Regent House, Regent street, London.
166,692 Pneumatic tire. P. Jones, 2 Mason street, Wigan.
166,702 Armored pneumatic tire. A. G. Canham, Wheaton Lodge, Branksome Wood Road, Bournemouth.
166,747 Device for packing tires. Dunlop Rubber Co., Limited, 1 Albany street, Regent's Park, London, and G. P. C. Powell, Para Mills, Aston Cross, Birmingham.

Chemical Patents will be found on page 119. Machinery Patents on page 122.

166,809 Tubeless pneumatic tire in open communication with a pneumatic reservoir formed by side disks of the wheel. W. H. Massy, 21 Curzon street, Dublin.
166,812 Stylographic pen. A. H. W. Westwood, Dadbrook, Claremont Park, Leith.
166,813 Respiratory apparatus. J. M. V. H. Guillemard, 57 rue Pierre Corneille, Lyons, France.
166,820 Pneumatic tire to be run with low inflation. E. B. Killein, 27 Queen Victoria street, London.
166,822 Sole pads. H. T. J. Garner, 82 Evering Road, Stoke Newington, and C. Russell, 26 Kingsland Road—both in London.
166,823 Resilient wheel with solid tire at edge and pneumatic tire around hub. J. Martin, Herbertstown Cooperative Agricultural & Dairy Society, Limited, Knocklong, County Limerick.

PUBLISHED SEPTEMBER 21, 1921

166,849 Non-slip balata canvas tread for motor-car pedals. J. Hart, 16 Walter street, Dennistoun, Glasgow.
166,938 Rubber buttons reinforced by fibers lying at right angles between sewing-holes. H. Craven, 20 Hereford Road, Southport.
167,009 Balloon valves. C. Bower, 184 Ampthill Road, Bedford.
167,073 Apparatus for making tire casings. Dunlop Rubber Co., Limited, 1 Albany street, Regent's Park, London, and C. Macbeth, Fort Dunlop, Erdington, Birmingham.
167,091 Reservoir pen. Y. Mukojima, 375 Minowa, Tokio, Japan.
167,116 Corset with elastic insert. R. M. Hahn, 6 Great Castle street, London.

NEW ZEALAND

PUBLISHED JULY 14, 1921

44,303 Resilient tire. The Standard Rubber Works Proprietary, Limited, 395 Collins street, Melbourne, Vic., assignees of A. J. Ostberg and A. Kenny, Judd street, Richmond, near Melbourne.

PUBLISHED AUGUST 25, 1921

44,398 Milking-machine teat-cup. The Auto Milking Machine Co., Limited, Regent street, Hawera, N. Z.
45,054 Heel-pad attached to suitable backing. C. Melville, 207 Riddiford street, Newtown, Wellington, N. Z.

GERMANY

PATENTS ISSUED, WITH DATES OF ISSUE

342,110 (January 9, 1921) Bougie or catheter. Dr. Abrecht Meyenberg, Potsdamerstrasse 27 b., Berlin.
342,295 (January 29, 1920) Injection syringe. William Heidemann, Rheinstrasse 77, Crefeld a Rh.
342,461 (April 5, 1919) Pneumatic tire. Saturn-Luftreifen-Gesellschaft Eichler & Co., Hanover.
342,864 (August 27, 1920) Tire. Otto Pfau, Schäftlarnstrasse 164, Munich.
342,868 (June 22, 1920) Rubber heel with a tin plate vulcanized into it. Gustav Milse, An den Häfen 69, Bremen.

TRADE MARKS

THE UNITED STATES

TWO KINDS OF TRADE MARKS NOW BEING REGISTERED

Under the rules of the United States Patent Office, trade marks registered under the Act of February 20, 1905, are, in general, fanciful and arbitrary marks, while those registered under the Act of March 19, 1920, Section 1 (b), are non-technical, that is, marks consisting of descriptive or geographical matter or mere surnames. To be registered under the latter act, trade marks must have been used for not less than one year. Marks registered under this act are being published for the first time when registered, any opposition taking the form of an application for cancellation.

GRANTED AUGUST 23, 1921, ACT OF FEBRUARY 20, 1905

NO. 145,995 AQUANON—fabric waterproofing composition. W. B. Price, Poughkeepsie, N. Y.
146,012 REVERE—golf balls. United States Rubber Co., New Brunswick, N. J., and New York, N. Y.

ACT OF MARCH 19, 1920, SECTION 1 (b)

146,033 GOODYEAR—tires and treads. The Goodyear Tire & Rubber Co., Akron, O.
146,047 RIVERSIDE—rubber belting and hose. W. S. Nott Co., Minneapolis, Minn.
146,048 CLIFTON—rubber belting and hose. W. S. Nott Co., Minneapolis, Minn.
146,050 SMOOTH GRIP—brake lining. The Russell Manufacturing Co., Middletown, Conn.

GRANTED AUGUST 30, 1921, ACT OF FEBRUARY 20, 1905

146,071 TORON—sulphur-terpene compounds and solutions. Clapp Products Co., Boston, Mass.
146,119 "AKSEL"—compounds for use in vulcanizing rubber. Michigan Chemical Co., Essexville, Mich.
146,147 ZIP—self-vulcanizing tire patches. John M. Stucker, Rosedale, Kans.

GRANTED SEPTEMBER 6, 1921, ACT OF FEBRUARY 20, 1905

146,177 BINNEY & SMITH CO. BLACKS OF SUPERIORITY—carbon black, gas black, bone black, drop black, ivory black, and oxid black. Binney & Smith Co., New York, N. Y.
146,205 RAINBOW—chewing gum. Merrell S. Copeland, Oelwein, Ia.
146,253 SNUGS—rubber boots, shoes, overshoes, and rubber-soled canvas shoes. Hood Rubber Co., Watertown, Mass.
146,339 REPUBLIC BELTING CO.—leather and rubber belting. Republic Belting Co., Inc., Baltimore, Md.
146,370 SAVAGE—tires and tubes. The Spreckels "Savage" Tire Co., San Diego, Calif.
146,397 KOLOYDO—pigment. E. M. & F. Waldo, New York, N. Y.
146,398 PIGMENT ACCELERATOR NO. 23—a chemical used in the manufacture of rubber. E. M. & F. Waldo, New York, N. Y.
146,399 SAPOLOR—pigment. E. M. & F. Waldo, New York, N. Y.

ACT OF MARCH 19, 1920 SECTION 1 (b)

146,433 SLIP-OVER—rubber baby pants. J. J. Beyerle Manufacturing Co., New York, N. Y.
146,434 OVER-ALL—rubber baby pants. J. J. Beyerle Manufacturing Co., New York, N. Y.
146,454 DOSS TIRES within section of tire—rubber tires. The Doss Rubber & Tube Co., Inc., Atlanta, Ga.
146,474 SLIP-ON—rubber heels. Gulich & Snyder Rubber Co., Columbus, O.
146,552 GUN-METAL—soles and heels of leather substitute. J. D. Prince, Boston, Mass.

RENEWALS

19,558 REVERE—belting, hose and packing. Revere Rubber Co., Boston, Mass. (Registered May 19, 1891.)
19,752 LITTLE GIANT—mechanical rubber goods. Revere Rubber Co., Boston, Mass. (Registered June 23, 1891.)
20,135 RED and the representation of a crescent—composition packing. Revere Rubber Co., Boston, Mass. (Registered September 15, 1891.)

GRANTED SEPTEMBER 13, 1921, ACT OF FEBRUARY 20, 1905

146,556 "BELDENITE"—rubber-covered electrical conductors. Belden Manufacturing Co., Chicago, Ill.
146,569 4 on representation of a tire—tires. A. Faure, New York, N. Y.
146,570 DEFENDER on a shield—tire reliners and inside and outside sleeves. The Federal Rubber Co., Cudahy, Wis.
146,571 DEFENDER—tire reliners and inside and outside sleeves. The Federal Rubber Co., Cudahy, Wis.
146,576 SMOOTH POINT SAFETY FOUNTAIN PEN, NEW YORK, U. S. A.—fountain pens. S. A. Harris, New York, N. Y.
146,587 LYNCO—arch supporters and bunion protectors. Lynn Rubber Manufacturing Co., Warren, R. I.
146,594 PFP arranged with triangles and letters of different size to fill diamond—pneumatic tires. The Parker Tire & Rubber Co., Indianapolis, Ind.
146,606 SEAMLESS—hot water bags or bottles. The Seamless Rubber Co., Inc., New Haven, Conn.
146,623 WSM arranged in a monogram—rubber machinery. The Wellman-Seaver-Morgan Co., Cleveland, O.

ACT OF MARCH 19, 1920, SECTION 1 (b)

146,627 FAULTLESS—automobile tops. The American Auto Top Co., Delphi, Ind. (See THE INDIA RUBBER WORLD, November 1, 1920, page 112.)
146,633 ATHOL—coated fabrics in the piece. Athol Manufacturing Co., Athol, Mass. (See THE INDIA RUBBER WORLD, April 1, 1921, page 494.)
146,638 LISTERATED—chewing gum. Common Sense Gum Co., New York, N. Y.
146,645 AKRON—gun recoil pads of rubber and leather. The B. F. Goodrich Co., New York, N. Y.
146,648 INDIA—tires, inner tubes, and tire repair materials and accessories. The India Tire & Rubber Co., Akron and Mogadore, O.

GRANTED SEPTEMBER 20, 1921, ACT OF FEBRUARY 20, 1905

146,668 CEL-O MINT—chewing gum. Amboy Products Co., Chicago, Ill.
146,678 AZO—zinc oxid and mixtures containing it, for use as pigments. American Zinc, Lead & Smelting Co., Boston, Mass.
146,728 DUNLOP—tires and tire tubes, shoes, and casings. Dunlop Tire & Rubber Corporation of America, Tonawanda, N. Y.
146,811 ONAZOTE—expanded vulcanized rubber for tires, tubes, shock absorbers, etc. C. L. Marshall, London, England. (See THE INDIA RUBBER WORLD, August 1, 1921, page 819.)
146,839 EMALINE—bituminous rubber paint. F. O. Pierce Co., New York, N. Y.

ACT OF MARCH 19, 1920, SECTION 1 (b)

146,924 TIRES THE TRADE PAPER OF THE TIRE INDUSTRY—monthly journal. Edward Lyman Bill, Inc., New York, N. Y.
146,927 BEST IN ANY CASE—inner tubes. The B. F. Goodrich Co., New York, N. Y.
146,929 LINCOLN—tires. Lincoln Tire & Rubber Co., Cleveland, Cincinnati, Dayton, etc., Ohio.
146,930 LONG-WEAR through representation of a tire—tires and tubes. The Longwear Rubber Co., Elyria, O.

THE DOMINION OF CANADA

REGISTERED

28,991 INSURANCE—fire extinguishers, parts and accessories. The Canadian Fire Hose Co., Limited, Montreal, Que.
29,082 MILLER—general rubber goods. The Miller Rubber Co., Akron, Ohio, U. S. A.
29,112 NATIONAL—pigments, chemicals, vulcanizing accelerators, etc., National Aniline & Chemical Co., Inc., New York City, U. S. A.
29,124 LITTLE GIANT—rubber or balata belting, etc. Canadian Consolidated Rubber Co., Limited, Montreal, Que.
29,125 CLIMAX—inner tubes, compression tubes, tires, tire liners, flaps, boots and blowout patches, and tire and tube cement. The Climax Rubber Co., Columbus, Ohio, U. S. A.
29,127 P. M. S.—rubber belting, hose, pulp screen diaphragm, and rolls. Gutta Percha and Rubber, Limited, Toronto, Ont.
29,131 STANLEY FERROSTAT, IT WILL NOT BREAK—rubber-finished vacuum-jacketed receptacles. Stanley Insulating Co., Great Barrington, Mass., and New York City, U. S. A. (See THE INDIA RUBBER WORLD, May 1, 1919, page 429.)
29,170 PRINCESS—hard rubber combs. American Hard Rubber Co., New York City, U. S. A.

29,180 KLEINERT'S—rubber sanitary clothing for children and adults, toilet cases, bathing-suit bags, flotation devices, tobacco pouches, bandages, hot-water bags, vulcanite, dam, sheeting, etc. I. B. Kleinert Rubber Co., New York City, U. S. A. (See THE INDIA RUBBER WORLD, June 1, 1918, page 342; December 1, 1919, page 157; December 1, 1920, page 183; March 1, 1921, page 437; and September 1, 1921, page 938.)

29,181 AUTO SHOES—tires. Ames Holden McCready Limited, Montreal, Que.

29,183 PIRELLI—general; tires. Pirelli & Co., Milan, Italy.

29,187 GLOBE—pneumatic tools and appliances. Canadian Allis-Chalmers, Limited, Toronto, Ont.

29,192 HEAVY TOURIST—rubber and balata goods. The Goodyear Tire & Rubber Co. of Canada, Limited, Toronto, Ont.

NEW ZEALAND

PUBLISHED JULY 14, 1921

15,581 WB inside broken square—insulated wire and cables. The Whitney Blake Co., New Haven, Conn., U. S. A.

PUBLISHED AUGUST 25, 1921

18,189 Representation of a man standing under a tree, all within conventional representation of a tire—rubber goods in Class No. 40. Wood-Milne, Limited, and G. S. Moulton & Co., Limited, 2 Central Buildings, Westminster, London, Eng.

18,218 BULLDOG—milling-machine pulsators, teat-cups, etc. Oldfield & Henry, Limited, 39 Fort street, Auckland, N. Z.

THE UNITED KINGDOM

PUBLISHED AUGUST 31, 1921

B404,800 BOSTON GARTER—garters. George Frost Co., 551 Tremont street, Boston, Mass., U. S. A.; address for service in the United Kingdom, care of Carpmaels, Ransford & Newton, 24 Southampton Buildings, London, W. C. 2.

413,258 "AVRORA"—fountain pens, ink and pencil erasers, etc. Isaia Levi, 9 via Basilica, Turin, Italy; address for service in the United Kingdom, care of Herbert Haddan & Co., 31-32 Bedford street, Strand, London, W. C. 2.

413,599 FLEXYDE—fiber-rubber belts for wear. The Marathon Tire & Rubber Co., 140 Front street, Cuyahoga Falls, Ohio, U. S. A.; address for service in the United Kingdom, care of F. Heron Roberts, Bridge House, 181 Queen Victoria street, London, E. C. 4. (See THE INDIA RUBBER WORLD, June 1, 1921, page 673.)

414,954 Representation of label bearing words: "PIONEER" BRAND OF RUBBER SOLUTION SPECIALLY PREPARED FOR PUNCTURES, TYRE REPAIRS AND GENERAL RUBBER REPAIR WORK—rubber solution. David Matz, 29 Park street, Cheetham, Manchester.

416,361 TORISIO—raincoats. Nathan Ramsden & Sons, Limited, 5 Brown street, Bolton, Lancashire.

416,765 JOYSPRAY—rubber bath fittings. S. G. Ford, 74-77 Imperial Buildings, Ludgate Circus, London, E. C. 4.

PUBLISHED SEPTEMBER 7, 1921

414,177 Representation of Thor holding tire in one hand and with the other grasping the letter T on a sign bearing the words THOR TYRES, the letter T serving to begin both words—pneumatic and solid tires. Aktieselskabet Dansk Afvulkaniserings Fabrik, Kioege, Denmark, and 210A Shaftesbury avenue, London, W. C. 2.

415,863 ETCO within an oval under the words TRADE MARK—rubber goods included in Class No. 40, excepting tires and accessories. G. A. Stetson trading as The Elastic Tip Co., 370 Atlantic avenue, Boston, Mass., U. S. A.; address for service in the United Kingdom, care of Sefton-Jones, O'Dell & Stephens, 285 High Holborn, London, W. C. 1.

PUBLISHED SEPTEMBER 14, 1921

413,160 BLUE BIRD and representation of a bluebird—tire-repair outfits. H. T. Stephens, 16 Florence Road, Ealing, London, W. 5.

416,276 CUTISAVA—surgical rubber gloves. "Rapson" Automobile Patents, Limited, 35 New Cavendish street, Great Portland street, London, W. 1.

416,301 Representation of a golf ball standing for those words in the trade mark ALBIT GOLF BALL DRYER—golf ball stands. C. K. Thorpe, 264 Devonshire Road, Forest Hill, London, S. E. 23; and J. and J. M. Allmann, 9 Cullum street, Fenchurch street, London, E. C. 3.

416,457 TUDENSUP—dental appliances, rubbers, plates, etc. Tubbs & Co., Limited, 34-36 Oxford street, London, W. 1.

416,693 BELDA—all goods included in Class No. 40. The Beldam Tyre Co. (1920), Limited, Windmill Road, Brentford, Middlesex.

416,694 BELDA—playing balls included in Class No. 49. The Beldam Tyre Co. (1920) Limited, Windmill Road, Brentford, Middlesex.

416,860 REGAIN—rubber and gutta percha goods not included in classes other than No. 40. Boots' Pure Drug Co., Limited, 37 Station street, Nottingham.

PUBLISHED SEPTEMBER 21, 1921

412,787 LIX—respirators and masks. Chemische Werke, formerly Auergesellschaft mit beschränkter Haftung Kommanditgesellschaft, 11-14 Ehrenbergstrasse, Berlin O. 17, Germany; address for service in the United Kingdom, care of Clement Lean, Thanet House, 231 Strand, London, W. C. 2.

B413,890 DICKBALATA—boots and shoes with soles of balata material. R. & J. Dick, Limited, 3 McDhail street, Greenhead, Glasgow.

415,152 BARDO—rubber repair. Smith & Barkwith, 44 Upper Marylebone street, London, W. 1.

B415,671 ONANDOFF—baby pants. I. B. Kleinert Rubber Co., 721 Broadway, New York City, U. S. A., and 87 Queen Victoria street, London, E. C. 4.

416,327 COLORBRAC—all goods included in Class No. 38. Irvine Wells, 68 Horton Road, Bradford, Yorkshire.

416,395 YOKE-IT and representation of a yoke—braces and suspenders. Irvine Wells, 68 Horton Road, Bradford, Yorkshire.

416,975 URPCO within a diamond—balls for games. United Rubber Products, Limited, 5 Fenchurch street, London, E. C. 3.

417,342 BARDO—a vulcanizing compound included in Class No. 1, for repairing damaged rubber goods. Smith & Barkwith, 44 Upper Marylebone street, London, W. 1.

DESIGNS

THE UNITED STATES

NO. 58,756 Tire tread. Patented August 30, 1921. Term 14 years. R. W. Hutchens, Eau Claire, Wis.

58,764 Tire. Patented August 30, 1921. Term 14 years. W. P. Keith, assignor to The Goodyear Tire & Rubber Co.—both of Akron, O.

58,778 Tire tread. Patented August 30, 1921. Term 14 years. A. E. Lichtman, New York, N. Y.

58,788 Tire tread. Patented August 30, 1921. Term 14 years. E. F. Lumber, assignor to Morgan & Wright—both of Detroit, Mich.

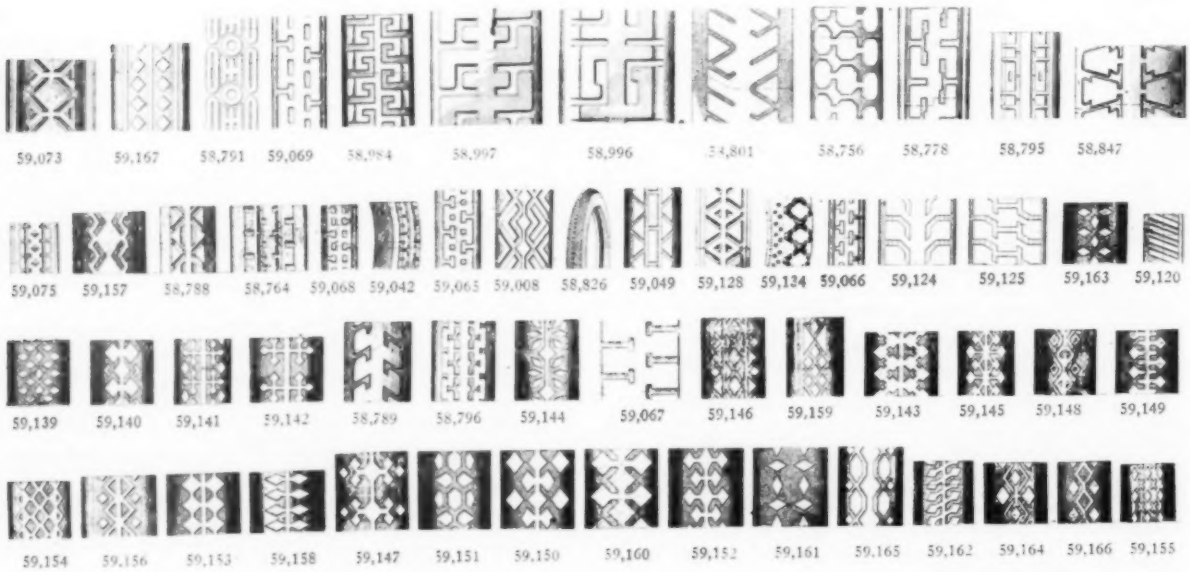
58,789 Tire. Patented August 30, 1921. Term 7 years. R. W. Lyons, Jefferson, Wis.

58,791 Tire. Patented August 30, 1921. Term 14 years. P. J. McHugh, Cincinnati, O.

58,795 Pneumatic tire shoe or tread. Patented August 30, 1921. Term 3½ years. J. Martin, New York, N. Y.

58,796 Pneumatic tire shoe or tread. Patented August 30, 1921. Term 3½ years. J. Martin, New York, N. Y.

58,801 Tire tread. Patented August 30, 1921. Term 14 years. L. E. Meyer, Cuyahoga Falls, assignor to the Firestone Tire & Rubber Co., Cleveland—both in Ohio.



58,826 Tire tread. Patented August 30, 1921. Term 7 years. H. J. Richards, assignor to The L. & M. Rubber Co.—both of Carrollton, O.

58,847 Tire. Patented August 30, 1921. Term 14 years. D. W. Whipple, assignor to Keystone Tire & Rubber Co.—both of New York, N. Y.

58,941 Rubber mat. Patented September 6, 1921. Term 14 years. T. G. Richards, Brookfield, assignor to Quabaug Rubber Co., North Brookfield—both in Mass.

58,942 Rubber matting. Patented September 6, 1921. Term 14 years. T. G. Richards, Brookfield, assignor to Quabaug Rubber Co., North Brookfield—both in Mass.

58,951 Tire patch. Patented September 6, 1921. Term 7 years. E. M. Steell, assignor to Porcupine Manufacturing Co.—both of Spokane, Wash.

58,984 Tire tread. Patented September 6, 1921. Term 7 years. H. S. Yost, assignor to Batavia Rubber Co.—both of Batavia, N. Y.

58,987 Elastic girdle. Patented September 13, 1921. Term 14 years. A. B. Beck, Jersey City, N. J.

58,996 Tire tread. Patented September 13, 1921. Term 14 years. R. E. Cartlidge, Akron, O., assignor to Lomer Armored Tire Co., Newcastle, Ind.

58,997 Tire tread. Patented September 13, 1921. Term 14 years. R. E. Cartlidge, Akron, O., assignor to Lomer Armored Tire Co., Newcastle, Ind.

59,008 Tire tread. Patented September 13, 1921. Term 7 years. J. F. Jamrowicz, Detroit, Mich.

59,024 Tire core. Patented September 13, 1921. Term 14 years. C. D. McCollough, Des Moines, Ia.

59,042 Tire tread. Patented September 13, 1921. Term 14 years. H. H. Swan, Grand Rapids, Mich.

59,049 Tire. Patented September 13, 1921. Term 14 years. E. G. Weiler, assignor to The Electric Vulcanizing Rubber Co.—both of Cleveland, O.

59,055 Advertising sign combining representation of a tire and a horse-shoe. Patented September 20, 1921. Term 7 years. J. T. Aultman, Milwaukee, Wis.

59,065 to 59,069, inclusive. Tire treads. Patented September 20, 1921. Term 14 years. W. M. Doucette, New York, N. Y.

59,073 Tire tread. Patented September 20, 1921. Term 14 years. S. T. Ehrlich, Newark, N. J.

59,075 Tire tread. Patented September 20, 1921. Term 14 years. C. T. Gardner, New York, N. Y., assignor to Ajax Rubber Co., Inc., Millbrook, N. Y.

59,120 Tire tread. Patented September 20, 1921. Term 7 years. K. Kurose, Seattle, Wash.

59,124 Tire tread. Patented September 20, 1921. Term 14 years. W. J. Murphy, Cedar Falls, Ia.

59,125 Tire tread. Patented September 20, 1921. Term 14 years. W. J. Murphy, Cedar Falls, Ia.

59,128 Tire casing. Patented September 20, 1921. Term 14 years. E. A. Reid, Trenton, N. J., assignor to Ajax Rubber Co., Inc., Millbrook, N. Y.

59,134 Cushion-tire tread. Patented September 20, 1921. Term 14 years. C. Soderlund, Akron, O.

59,139 to 59,159, inclusive. Tires. Patented September 20, 1921. Terms 3½ years. R. S. Trogner, assignor to The Goodyear Tire & Rubber Co.—both of Akron, O.

59,160 Tire. Patented September 20, 1921. Term 14 years. R. S. Trogner, assignor to The Goodyear Tire & Rubber Co., Akron, O.

59,161 to 59,167, inclusive. Tires. Patented September 20, 1921. Terms 3½ years. R. S. Trogner, assignor to The Goodyear Tire & Rubber Co.—both of Akron, O.

GERMANY

DESIGN PATENTS ISSUED, WITH DATES OF ISSUE

786,864 (July 6, 1921) Closure for injection syringes for medical purposes. Heinrich and August Giehl, Friedberger Landstrasse 62, Frankfort-on-the-Main.

786,883 (July 4, 1921) Inhaling apparatus. Johannes Marcuse, Kurfürstendamm 258, Berlin.

787,029 (July 5, 1921) Hypodermic syringe. Th. Knoebel, Basel; represented by Dr. Gustav Rive, Berlin-Pankow.

787,095 (June 27, 1921) Two-sided rupture band. Philipp Steuer Sohn, Konstanz.

787,096 (June 27, 1921) Simple rupture band. Philipp Steuer Sohn, Konstanz.

787,174 (March 9, 1921) Rubber nipple. Otto Dillner, Torgauerstrasse 30, Leipzig-Neusellerhausin.

787,304 (July 18, 1921) Rubber heel. Christian Johannsen, Blumenstrasse 25, Friedrichsort.

787,400 (July 22, 1921) Rubber heel. Otto Maser, Costritz, near Dresden.

787,427 (July 11, 1921) Sanitary band. Dr. Julius Schnabel, Bisperode, near Hameln-on-the-Weser.

787,546 (July 21, 1921) Extensible pessary with closing flap. Fritz Schulz, Hohenzollernstrasse 60, Gelsenkirchen.

787,612 (July 7, 1921) Sanitary napkin. Freudenberger & Co., Göppingen, Württemberg.

787,617 (July 18, 1921) Ferrule for stick, with exchangeable rubber plug. Hermann Haidacher, Neckarstrasse, 231, Stuttgart.

787,752 (July 8, 1921) Rubber sole. Georg Klein, Rodenkirchen.

787,766 (July 16, 1921) Rubber heel. Friedrich Laudan, Elise-Averdieckstrasse, 1, Hamburg.

787,817 (March 14, 1921) Rubber sole. Balatawerke Ferdinand Stein, Hanover-Wülfel.

787,878 (July 29, 1921) Rubber shoe with link straps and steel inlay. Else Buckenauer, Grünberg, Silesia.

788,017 (July 23, 1921) Rubber sole with fastening plate of metal. Richard Wirtz, Wald, Rhineland.

788,099 (July 15, 1921) Rubber sole with reinforced fabric lining and prepared gumming surface. Friedrich Theilmann G. m. b. H., Frankfort-on-the-Main-Niederrad.

788,105 (July 21, 1921) Aluminium insert for rubber heels and soles. Walter Hötten and Ernst Bredtmann, Mettmann.

788,112 (July 29, 1921) Rubber heel. Heinrich Hespen, Rastede, near Oldenburg.

788,120 (August 1, 1920) Rubber sole with balata insert. Balata-Werke Ferdinand Stein, Hanover-Wülfel.

788,620 (August 5, 1921) Rubber shoe sole. Nikolaus Theis, Viktoriastrasse 89, Solingen.

789,015 (July 25, 1921) Rubberized fabric covered with cloth dust in various colors. Paragummiwerk m. b. H., Köln-Deutz.

789,022 (August 4, 1921) Pneumatic sole for all kinds of shoes. Karl Liedtke, Hauptbahnhof, Saarbrücken.

789,414 (July 14, 1921) Inner tube with two ends. E. Elias, Gladbach, Westphalia.

789,464 (June 6, 1921) Cover with steel insert, for bicycle tires. Wilhelm Lutz, Katernbergerstrasse 25, Gelsenkirchen.

789,637 (July 21, 1921) Toy figure of sponge rubber, with head and limbs of other material. Fa. Curt Schellbach, Seiferitz-Meerane, Saxony.

789,694 (February 7, 1921) Hollowing for rubber sucker on dental gumplates. Paul Weyel & Täschner, Düren, Rhineland.

789,879 (July 2, 1921) Elastic tire with non-skid device. Andreas Formanski, Fürstenwalde, Spree.

789,919 (August 9, 1921) Non-skid chain for double solid tires. Walter Lion, Antonstrasse, Unter den Hochleisen, Dresden.

790,297 (August 11, 1921) Rupture band. Charles Cluthe sen., Mainluststrasse 9, Frankfort-on-the-Main.

TRADE-MARK SECTION OF THE OFFICIAL GAZETTE

In response to the public demand a section of the *Official Gazette* containing all matter relating to trade-marks may be procured separately beginning with volume 290, September 6, 1921.

The trade-marks section will include; trade marks published under the Act of 1905; trade marks registered under the Act of 1905 and under the Act of 1920; labels and prints; the indexes, and decisions from time to time in trade-mark cases.

The cost will be five cents each number, or $2.50 for annual subscriptions, to which must be added $2 to cover postage to subscribers in foreign countries.

DEVELOPING THE IDEAL SECTION OF THE LINCOLN HIGHWAY

In an attempt to keep up the public interest in the subject of highway design and construction, motion pictures have been recently taken, showing that stretch of road between Dyer and Schererville, Indiana, the site of the proposed "Ideal Section" of the Lincoln Highway. These pictures were taken in order to compare the present condition of this roadway with the section when completed, which it is hoped will occur in the early part of 1922.

J. N. Gunn, who is president of the Lincoln Highway Association, is also vice-president of the United States Rubber Co., that, by its financial contributions, is aiding in the construction of the "Ideal Section."

"Type and design of construction for our roads are questions of burning interest to the general public at this time," said Mr. Gunn. "With hundreds of millions of dollars now available and more being made available by the public continually for the construction of permanent roads, every American should take an interest in those vital problems of highway design and construction, the study of which should tend to save the tax-paying public millions of dollars in the future."

SUGGESTIONS FOR TRUCK USERS

When solid rubber tires, used on a one-ton truck, have become badly worn it is advisable to replace them with pneumatic tires. The present wheels can be altered by building a new felloe and felloe band to accommodate pneumatic rims.

Sight-seeing buses, built on a 3½-ton truck chassis to carry forty passengers should have, for the rear wheels, 36 by 10 solid tires of the "Monotwin" type 38 by 7 pneumatic tires for the front wheels. Pneumatic tires have not been sufficiently perfected for use on rear wheels of buses, while the "Monotwin" tire, with its cushioning and non-skidding qualities, is ideal equipment.

For commercial cars, 33 by 4 Royal cord tires are recommended as they are much more flexible and resilient than fabric, and therefore much less subject to failure due to the strain of starting, braking, and stopping. Although the initial cost of cord tires is greater, they have been found to minimize tread wear and abrasion, therefore lessening the cost per mile.—Technical Service Bureau, United States Tire Co.

Review of the Crude Rubber Market

NEW YORK

DURING the last week of September, spot prices for rubber declined from three-quarters to one cent a pound with dealers holding firm for 14¼ to 15 cents for ribbed smoked sheets. Factory demand lessened on the sag in prices and dealers were inclined to buy rather than sell. Early in October, London and Singapore cables indicated firmer prices.

The New York market was high and strong with few transactions. This situation was further promoted by a strike of dock men and weighers which delayed unloading cargoes and inspections and deliveries by dealers.

Consumers are hopeful of lower values although buyers are firmly sustaining prices. Spot quotations are lower than those at which rubber can now be imported and higher prices are expected.

During the week ended October 22, the market was very active and business was done in all grades and positions. Spot ribs advanced even to 17¼ to 17½ cents. January-March sold as high as 18¾ to 18½, and January-June at 18¾-19½ cents. The activity and rise was partly due to the threatened nation-wide railroad strike. The call for immediate shipment of rubber on contract by the factories caused many dealers to make spot purchases for these deliveries. Spot first latex crêpe and ribbed smoked sheets were offered at essentially the same price, 16½ cents, firm and active.

Continued firm and advancing prices may be looked for since both dealers and consumers find no sellers of spot ribs at 16 cents offered.

Brazilian Farás have held firmly during the month at 21½ to 22 cents for upriver fine. Balata has been in fair demand, and the Pontianak market was quite active late in the month.

Importations of all grades during September were 15,088 tons compared with 11,636 tons last year. Plantation arrivals for September were 14,653 tons, compared with 10,974 tons a year ago. Total imports of all grades for nine months ended September 30, 1921, were 119,466 tons, compared with 192,973 tons for the corresponding period in 1920.

Spot and future quotations on standard plantation and Brazilian grades were as follows:

PLANTATIONS. October 1. Spot, first latex crêpe, 15¼ cents; November—December 15¼ cents; January—March, 16 cents; April—June, 17½ cents. October 25. Spot, first latex crêpe, 16¼ cents; November—December, 16¾ cents; January—March, 17¼ cents; April—June, 18¾ cents.

October 1. Spot, ribbed smoked sheets, 15 cents; November—December, 15¼ cents; January—March, 16 cents; April—June, 17 cents. October 25. Spot, ribbed smoked sheets, 16¾ cents; November—December, 16¾ cents; January—March, 17½ cents; April—June, 18½ cents.

October 1. Spot, No. 1 amber crêpe, 14 cents; November—December, 14¾ cents. October 25. Spot, No. 1 amber crêpe 16 cents; November—December, 16½ cents; January—March, 17 cents; April—June, 18 cents.

October 1. Spot, No. 1 rolled brown crêpe, 12 cents; November—December, 12 cents. October 25. Spot, No. 1 rolled brown crêpe, 13½ cents; November—December, 13¾ cents; January—March, 14½ cents.

SOUTH AMERICAN PARÁS AND CAUCHO. October 1. Spot, upriver fine, 21¼ cents; islands fine, 19 cents; upriver coarse, 11½ cents; islands coarse, 8 cents; Cametá, 8¾ cents; caucho ball, 12 cents. October 25. Spot, upriver fine, 21¾ cents; islands fine, 20 cents; upriver coarse, 12 cents; islands coarse, 10 cents; Cametá, 10 cents; caucho ball, 10½ cents.

NEW YORK QUOTATIONS

Following are the New York spot quotations, for one year and one month ago, and October 25, the current date:

	November 1, 1920	October 1, 1921	October 25, 1921
PLANTATION HEVEA			
First, latex crêpe	$0.21 @.22	$0.16 @	$0.16½ @.16¾
Off latex crêpe	@	.15 @	.16 @
Amber crêpe No. 1	.19 @	.13½ @.14	.16 @
Amber crêpe No. 2	.18 @	.12½ @.13	.15 @
Amber crêpe No. 3	.17 @	.11½ @.12	.14½ @
Brown crêpe, thick and thin	.18 @	.13 @.13½	.15¼ @
Brown crêpe, specky	.15 @	.12 @	.14½ @
Brown crêpe, rolled	.15 @	@	.13½ @
Smoked sheet, ribbed	.19½ @.20	.15¾ @	.16¼ @
Smoked sheet, plain	.18½ @	.13½ @	@
Unsmoked sheet	.17½ @	@	@
Colombo scrap No. 1	.16 @	@	.13 @
Colombo scrap No. 2	.15 @	@	.12 @
EAST INDIAN			
Assam crêpe	@	@	@
Assam onions	@	@	@
Penang block scrap	@	@	@
PONTIANAK			
Banjermassin	.09 @	.06 @.06½	.07 @
Palembang	@	@	@
Pressed block	.18 @	.11 @	.11½ @
Sarawak	@	.05½ @	.06 @
SOUTH AMERICAN			
PARAS			
Upriver, fine	.23½ @.24	.21 @	.21½ @.21¾
Upriver, medium	.20 @	.17 @	.18½ @.19½
Upriver, coarse	.15 @.16	.11 @	.12 @
Upriver, weak, fine	.17 @	.18 @	.18 @
Islands, fine	.19 @.20	.19 @.20	.20 @.21
Islands, medium	.19 @	.14½ @	.18 @
Islands, coarse	.15 @	.08 @	.10 @.11
Cametá	.14 @	.09 @.10	*.10 @
Acre Bolivian, fine	.25 @	.21 @.22	.21½ @.22
Madeira, fine	.29 @	.24 @	.23½ @.24
Beni Bolivian	@	.21½ @.22	.21½ @.22
Peruvian, fine	.22 @	.18¾ @	.19 @.20
Tapajos, fine	.21 @	.19 @	.19½ @.20½
CAUCHO			
Upper caucho ball	.16 @	.11 @	.11¾ @
Lower caucho ball	.15 @	.10½ @	.10½ @
MANICOBAS			
Ceará negro heads	*.18 @	*.10 @	*.10 @
Ceará scrap	*.10 @	*.08 @	*.08 @
Manicoba, 30% guaranty	*.15 @	*.10 @	*.10 @
Mangabeira thin sheet	*.20 @	*.12 @	*.12 @
CENTRALS			
Corinto scrap	@	.08 @.10	.08 @.11
Central scrap	@	.08 @.10	.08 @.11
Central scrap and strip	@	.07 @.09	.07 @.09
Central wet sheet	@	.04 @.05	.04 @
Esmeralda sausage	@	.08 @.10	.08 @.11
Guayule, 20% guaranty	.25 @	@	@
Guayule, washed and dried	.37 @	.26 @	.25 @
AFRICANS			
Benguela, No. 1, 28½%	@	.04 @.04½	@
Benguela, No. 2, 32½%	@	@	.06 @
Conakry niggers	@	.06 @	@
Congo prime, black upper	@	@	@
Congo prime, red upper	@	@	@
Kassai, black	@	@	@
red	@	@	@
Massai sheets and strings	@	.16¾ @	@
Niger flake, prime	@	.13 @.15	@
Rio Nunez ball	@	@	@
Rio Nunez sheets, strings	@	@	@
GUTTA PERCHA			
Gutta Siak	.19 @	.15 @	.16 @.16½
Red Macassar	2.90 @	2.50 @2.70	2.75 @
BALATA			
Block, Ciudad Bolivar	.70 @	.53 @.54	.54 @.55
Colombia	.46 @	.41 @.42	.45 @.47
Panama	.33 @	.41 @.42	.45 @.47
Surinam sheet	.70 @	.63 @.64	.64 @.66
amber	.76 @	.70 @.71	.69 @.70

*Nominal

RECLAIMED RUBBER

The market for reclaimed rubber remains essentially unchanged. Demand has increased in some lines and diminished in others. Reclaiming plants are operating on less than half capacity output. The outlook is encouraging, due to the firm rise in crude rubber prices and increased activity apparent in some branches of rubber goods manufacture.

The quotations below are nominal.

NEW YORK QUOTATIONS

October 25, 1921

Prices subject to change without notice.

STANDARD RECLAIMS	
Floating	$0.12 @ $0.13
Friction	.12 @ .13
Mechanical	.09 @ .11
Shoe	.10½ @ .11
Tires, auto	.10½ @ .11
truck	.09 @ .11
White	.13 @ .14

COMPARATIVE LOW AND HIGH NEW YORK SPOT RUBBER PRICES

	October 1921*	October 1920	October 1919
PLANTATIONS			
First latex crêpe	$0.15 @ $0.17	$0.21 @ $0.26	$0.49½ @ $0.55
Smoked sheet, ribbed	.14¾ @ .17	.20 @ .24	.48½ @ .54
PARAS			
Upriver, fine	.21 @ .23	.23½ @ .26	.52 @ .55
Upriver, coarse	.11¼ @ .12	.15 @ .16½	.33 @ .35
Islands, fine	.18 @ .21½	.20 @ .24	.48 @ .48½
Islands, coarse	.08 @ .10¼	.14½ @ .16	.22 @ .23½
Cametá	.08¾ @ .10¼	.14 @ .15½	.22 @ .23

*Figured to October 26, 1921.

SINGAPORE RUBBER MARKET

GUTHRIE & CO., Limited, Singapore, report under date of September 14, 1921:

The local rubber market continues steady but quiet, the bulk of the business being transacted at the weekly sales, where the demand has of late been remarkably good. At the auctions today, there was a large attendance of buyers and the various catalogs were quickly cleaned out, 563 tons being sold out of 590 tons offered.

Standard sheet at 27½ cents, improved 1 cent on the week, and off-quality lots showed a stronger tendency. Crêpe was again eagerly competed for up to 28 cents, a nominal decline of ½-cent. Off-quality and lower-grade crêpes were easy of sale at last week's prices. The following is the course of values:

	In Singapore per pound	Sterling Equivalent per pound in London
Sheet, fine ribbed smoked	27½ @	—/ 9½ @
Sheet, good F. A. Q	26 @ 27	—/ 9⅜ @ —/ 9⅜
Sheet, off-quality	21 @ 25½	—/ 7⅝ @ —/ 9
Crêpe, fine pale	27½ @ 28	—/ 9⅞ @ —/10
Crêpe, good pale	24½ @ 27	—/ 9 @ —/ 9¼
Crêpe, off-quality	20 @ 24	—/ 7¼ @ —/ 8⅜
Crêpe, fine brown	19 @ 23	—/ 7½ @ —/ 8⅜
Crêpe, good brown	15 @ 18½	—/ 6⅛ @ —/ 7⅜
Crêpe, dark	14½ @ 18	—/ 6¼ @ —/ 7¼
Crêpe, bark	13 @ 15	—/ 5¾ @ —/ 6⅜

AMSTERDAM RUBBER MARKET

JOOSTEN & JANSSEN, Amsterdam, report under date of September 30, 1921:

In comparison with previous week the turnover in spot parcels was rather small this week, which was first due to the small supply and later on to the declining demand. A fair business was done in near-by deliveries. October and November crêpe were alternately sold at 48, 48½ and 49. January-March sheets still brought 51. Closing prices are nominal, with little demand, as follows:

Hevea crêpe, Fl. .47½	Sheets, Fl. .47 spot
Hevea crêpe, Fl. .49	Sheets, Fl. .49 October to December
Hevea crêpe, Fl. .52	Sheets, Fl. .51½ January to March
Hevea crêpe, Fl. .54½	Sheets, Fl. .54 April to June

ANTWERP RUBBER MARKET

OSTERRIETH & CO., Antwerp, report under date of October 1, 1921:

Our market has enjoyed a considerably better demand during the last fortnight, and, following the rise of the London plantation market, manufacturers have come into the market more freely and have covered some of their wants for the coming months, even as far as April-May of next year. But for the unhappy and rather unexpected drop of the exchange in Central Europe, we are sure a considerable business could have been done; however, as it is, the set back in the exchange still leaves many buyers uncovered, who, it is hoped, will have to appear again in the market very soon. We close the week as follows:

	Crêpes, Francs per Kilo	Sheets, Francs per Kilo
October, 1921	4.70	4.55
November	4.80	4.60
December	4.95	4.60
January, 1922	5.00	4.70
February	5.10	4.85
March	5.25	4.90
April	5.35	4.95
May	5.45	5.00
June	5.45	5.05
July	5.45	5.05
August	5.45	5.05
September	5.45	5.05

The S. S. "Mayumbe," just arrived from the Congo, has landed another 135 tons of Congo rubber. In these sorts transactions have been between very narrow limits, and the only transactions worth mentioning are in red Kasai nuts at francs 2 per kilo, and rooty Benguela at franc. 0.70. This level of prices is certainly attractive, and if the present steadiness in the plantation market holds on, we foresee a better demand for this quality too.

Stock today: About 2,200 tons.

CEYLON RUBBER EXPORTS

	January 1, to August 26 1920	1921
To United Kingdom ..... pounds	26,403,606	20,569,382
Austria	.....	980
Belgium	147,150	254,384
France	575,254	317,900
Germany	164,515	2,454,628
Holland	28	374,281
Denmark	.....	51,610
Italy	112,000	104,160
Norway	.....	2,240
Western Australia	56	.....
Victoria	190,469	127,390
New South Wales	284,178	103,800
United States	26,101,165	31,980,351
Canada and Newfoundland	425,600	419,148
India	586	8,882
Straits Settlements	44,800	.....
Japan	157,667	276,816
Totals ..... pounds	54,607,074	57,045,952

Compiled by the Ceylon Chamber of Commerce.

NEW YORK AVERAGE SPOT RUBBER PRICES

PRICES IN CENTS PER POUND

	SEPTEMBER, 1921																	OCTOBER, 1921							
	12	13	14	15	16	17	19	20	21	22	23	24	26	27	28	29	30	1	3	4	5	6	7	8	10
PLANTATIONS																									
Sheet																									
Ribbed smoked	14⅛	14	14	14	14⅜	14⅜	14⅜	14⅜	14⅞	15¼	15⅜	15⅜	15⅝	15⅛	15⅜	14⅞	14⅞	14⅞	14⅞	14⅞	15⅜	15⅜	15⅜	15¼	15⅜
Crêpe																									
First latex	14⅛	14⅛	14⅛	14⅛	14¼	14¼	14⅜	14⅝	15	15¼	15⅜	15⅜	15⅝	15¼	15⅛	14⅞	14⅞	15	14⅞	15¼	15⅜	15⅜	15⅛	15⅜	15⅜
Off latex	13⅛	13¼	13⅛	13¼	13⅜	13½	13¾	13¾	13¾	14⅛	14⅜	14⅜	14½	14¼	14⅛	14	14	13¾	14	14¼	14¼	14⅝	14¼	14¼	14¼
No. 1 blanket	12¼	12½	12½	12½	12¾	12¾	13⅛	12¾	13¾	13⅝	13¼	13¾	14⅛	14	13¾	13¾	13¾	13⅞	13¾	14⅛	14¼	13¾	14⅛	14⅜	14⅜
No. 2 blanket	11¼	11½	11½	11½	11¾	11¾	12⅛	11¾	12¾	12¾	12¾	12¾	13	12⅝	12⅝	12¾	12¾	12⅞	12¾	13⅛	13½	13	13⅛	13¼	13⅜
No. 3 blanket	10¾	10¾	10¾	10¾	11⅛	11⅛	11⅛	11	11¾	11¾	11¾	11¾	12⅛	12¼	12	11¾	12	11⅞	12	12⅛	12¼	12¼	12¼	12¼	12½
Thin, clean brown	11½	11½	11½	11½	11½	11½	12¼	12¼	12½	12¾	12¾	12¾	13	12¾	12¾	12¾	12¾	12¾	12⅜	12¾	13	13	13¼	13⅜	13½
Specky brown	10½	10¾	10¾	10¾	10¾	10¾	11¼	11¼	11¼	11⅜	11¾	11¾	12	11¾	11¾	11¾	12¼	12¼	11⅜	12¼	12¼	12¼	12¾	12½	12½
Rolled brown	10¾	10¾	10¾	10¾	11	11	10⅞	11⅛	11	11½	11¾	11¾	12¼	12	12⅛	12⅛	11¾	11¾	12	11¾	11⅞	11¾	11¾	12¼	11¾

PLANTATION RUBBER EXPORTS FROM MALAYA

(These figures include the production of the Federated Malay States, but not of Ceylon.)

	January 1 to July 31, 1921	January 1 to September 8, 1921			
	Singapore	Malacca	Penang	Port Swettenham	Totals
To United Kingdom ..*pounds*	32,311,899	2,486,353	12,525,532	12,724,328	60,048,112
The Continent..	7,030,305	1,739,485	157,666	124,492	9,051,948
Japan	25,259,573	.....	.....	37,575	25,297,148
Ceylon	44,627	.....	183,465	410,445	638,537
United States and Canada	84,598,538	15,640	1,835,233	.....	86,449,411
Australia	509,294	806	.....	.....	510,100
Other countries.	15,680	.....	796,533	.....	812,213
Totals, *pounds*.	149,769,916	4,242,284	15,498,429	13,296,840	182,807,469

Compiled by Barlow & Co., Singapore.

STRAITS SETTLEMENTS RUBBER EXPORTS

An official report from Singapore states that 7,939 tons of plantation rubber were exported from Straits Settlements ports in the month of August as against 10,598 tons in July, and 6,673 tons in the corresponding month last year. Transhipments amounted to 2,218 tons. The total exports for eight months of the current year amounted to 62,449 tons compared with 90,929 tons last year, and 99,476 tons in 1919. Appended are the comparative statistics:

	1919	1920	1921
January .....*tons*	14,404	13,125	5,809
February	15,661	17,379	5,813
March	20,908	5,931	7,275
April	10,848	9,768	6,091
May	15,845	15,617	8,813
June	5,059	11,663	10,111
July	7,818	10,773	10,598
August	8,933	6,673	7,939
Totals .....*tons*	99,476	90,929	62,449

These figures include transhipments of rubber from various places in the neighborhood of the Straits Settlements, such as Borneo, Java, Sumatra and the non-Federated Malay States, as well as rubber actually exported from the Colony, but *do not* include rubber exports from the Federated Malay States.

FEDERATED MALAY STATES RUBBER EXPORTS

An official report from Kuala Lumpur states that 7,603 tons of plantation rubber were exported from the Federated Malay States in the month of August as compared with 5,554 tons in July and 9,140 tons in the corresponding month last year. The total exports for eight months of the current year amounted to 54,666 tons, compared with 72,658 tons in 1920, and 69,983 tons in 1919. Appended are the comparative statistics:

	1919	1920	1921
January .....*tons*	7,163	11,119	7,085
February	10,809	9,781	6,091
March	10,679	9,524	7,408
April	7,664	8,375	7,444
May	7,308	7,627	7,658
June	7,094	9,049	5,823
July	8,640	8,043	5,554
August	10,626	9,140	7,603
Totals .....*tons*	69,983	72,658	54,666

PLANTATION RUBBER EXPORTS FROM JAVA*

	July		Seven Months Ended July	
	1920	1921	1920	1921
To Netherlands .....*kilos*	397,000	225,000	2,609,000	3,998,000
Great Britain	924,000	261,000	4,714,000	5,648,000
Germany	24,000	71,000	59,000	251,000
United States	979,000	693,000	9,105,000	4,106,000
Singapore	369,000	120,000	2,651,000	1,639,000
Japan	.....	8,000	184,000	103,000
Australia	114,000	.....	163,000	211,000
Other countries	11,000	31,000	25,000	51,000
Totals .....*kilos*	2,818,000	1,409,000	19,510,000	16,007,000
Ports of origin:				
Tandjong Priok.....*kilos*	1,261,000	837,000	9,185,000	7,130,000
Samarang	34,000	26,000	280,000	300,000
Soerabaya	1,297,000	510,000	9,465,000	7,131,000

*The June figures are verified.

LONDON AND LIVERPOOL CRUDE RUBBER IMPORTS AND EXPORTS

	Week Ended			
1921	Sept. 10	Sept. 17	Sept. 24	Oct. 1
Imports—London:				
Straits .....*tons*	623	318	695	764
Ceylon	291	261	142	335
British India	7	21	100	40
British North Borneo.....	4	....	....	67
Dutch East Indies.....	19	....	200	61
Java	....	....	96	....
Kenya Colony	....	....	....	4
Total .....*tons*	944	600	1,233	1,271
Exports—London:				
France .....*tons*	80	115	223	268
Belgium	16	40	6	14
Holland	2,320*	107	28	101
Italy	33	81	10	10
Germany	134	86	101	351
New York	514	319	84	1,720
Sweden	....	1	....	....
Boston	....	35	....	....
Montreal	....	2	....	....
Norway	....	....	....	5
Denmark	....	....	....	2
Total .....*tons*	3,097	786	452	2,471
Imports—Liverpool:				
Ceylon .....*tons*	12	....	....	....
British India	33	....	28	25
Straits	143	17	160	....
Dutch East Indies.....	93	12	....	....
Total .....*tons*	281	29	188	25
Exports—Liverpool:				
France .....*tons*	....	14	35	....
Germany	....	2	....	....
Toronto	....	3	....	....
Spain	....	....	2	....
New York	....	....	15	....
Total .....*tons*	....	19	52	....

*Via Rotterdam; the shipments to Rotterdam include deliveries to Continental centers and also transhipment to New York.

Compiled by Lavington Bros., Limited, continental and colonial carriers, 68 & 69 Old Bailey, London, E. C. 4, England.

CRUDE RUBBER ARRIVALS AT ATLANTIC PORTS AS STATED BY SHIPS' MANIFESTS

PARAS AND CAUCHO AT NEW YORK

	Fine	Medium	Coarse	Caucho	Totals Pounds
SEPTEMBER 18. By the S. S. "Polycarp," from Pará and Manáos.					
General Rubber Co.....	224,000	.....	.....	.....	224,000
SEPTEMBER 18. By the S. S. "Polycarp," from Pará.					
Schafer & Meyer.....	22,481	.....	34,971	.....	57,452
OCTOBER 21. By the S. S. "Virgil," from Manáos.					
Paul Bertuch	.....	.....	.....	53,214	53,214
OCTOBER 21. By the S. S. "Virgil," from Pará.					
Schafer & Meyer.....	22,481	.....	.....	.....	22,481
OCTOBER 25. By the S. S. "Denis," from Pará and Manáos.					
General Rubber Co.....	78,400	.....	.....	.....	78,400
OCTOBER 26. By the S. S. "Denis," from Iquitos.					
Ultramares Corporation..	24,068	.....	.....	.....	24,068
OCTOBER 26. By the S. S. "Denis," from Pará.					
Schafer & Meyer.....	.....	.....	.....	.....	*7,714
OCTOBER 15. By the S. S. "Dominic," from Manáos.					
H. A. Astlett & Co.....	200,000	20,000	3,000	.....	223,000
Poel & Kelly, Inc.....	39,100	.....	14,300	33,120	86,520
OCTOBER 15. By the S. S. "Dominic," from Pará and Manáos.					
General Rubber Co.....	306,900	.....	.....	105,280†	412,180
OCTOBER 15. By the S. S. "Dominic," from Pará.					
Schafer & Meyer.....	67,443	.....	44,880	.....	112,323

*Cametá; washed and dried in Brazil.
†Includes 98,560 lbs. cametá.

UNITED STATES CRUDE AND WASTE RUBBER IMPORTS FOR 1921 (BY MONTHS)

1921	Plantation	Paras	Africans	Centrals	Guayule	Manicoba and Mato Grosso	Balata	Miscellaneous	Waste	Totals 1921	Totals 1920
January .....*tons*	12,819	1,312	43	3	.....	.....	41	173	1,071	15,462	22,401
February	7,913	432	269	2	25	.....	25	216	37	8,919	33,984
March	12,241	1,794	377	1	.....	3	29	7	345	14,797	33,998
April	16,861	403	.....	5	.....	.....	64	226	7	17,566	24,957
May	9,127	1,570	.....	2	33	.....	40	186	41	10,999	28,666
June	12,361	1,091	.....	25	.....	.....	49	203	72	13,801	15,606
July	11,140	495	27	30	.....	.....	25	189	34	11,940	17,487
August	13,031	899	41	3	.....	.....	21	102	22	14,119	15,066
September	14,653	416	15	4	.....	.....	41	211	99	15,439	12,414
Totals, 9 months, 1921....	110,146	8,412	772	75	58	3	335	1,513	1,728	123,042	.....
Totals, 9 months, 1920....	172,802	14,973	3,756	673	734	35	438	7,588	3,580	.....	204,579

Compiled by The Rubber Association of America, Inc.

PLANTATIONS

(Figured at 180 pounds net to the bale or case.)

	Shipment from:	Shipped to:	Pounds	Totals
SEPTEMBER 23. By the S. S. "City of Hankow," at New York.				
Meyer & Brown, Inc....	Colombo	New York	134,400	
Chas. T. Wilson Co., Inc.	Colombo	New York	45,180	
General Rubber Co.....	Colombo	New York	358,400	
Peel & Kelly, Inc.....	Colombo	New York	11,160	
L. Littlejohn & Co., Inc.	Colombo	New York	134,400	
Fred Stern & Co.....	Colombo	New York	22,500	
Various	Colombo	New York	39,960	746,000
SEPTEMBER 23. By the S. S. "City of Hankow," at Boston.				
Hood Rubber Co.....	Colombo	Watertown	78,400	78,400
SEPTEMBER 25. By the S. S. "City of Cambridge," at New York.				
Pacific Trading Corporation of America.....	Colombo	New York	87,300	
Meyer & Brown, Inc....	Colombo	New York	201,600	
Chas. T. Wilson Co., Inc.	Colombo	New York	52,200	
Whittall & Co. of Ceylon, The Goodyear Tire & Rubber Co.....	Colombo	Akron	57,060	
L. Littlejohn & Co., Inc..	Colombo	New York	840,800	
Fred Stern & Co.....	Colombo	New York	22,440	
Continental Rubber Co. of New York.....	Colombo	New York	11,200	1,436,580
SEPTEMBER 25. By the S. S. "City of Cambridge," at Boston.				
Hood Rubber Co.....	Colombo	Watertown	78,400	78,400
SEPTEMBER 26. By the S. S. "Westerdyk," at New York.				
Baird Rubber & Trading Co.	Rotterdam	New York	123,200	
Various	Rotterdam	New York	2,016,760*	
Hood Rubber Co.....	London	Watertown	67,200	2,207,160
SEPTEMBER 26. By the S. S. "Buekelsdyk," at Boston.				
Hood Rubber Co.....	London	Watertown	78,400	78,400
SEPTEMBER 30. By the S. S. "Rotterdam," at New York.				
L. Littlejohn & Co., Inc..	Rotterdam	New York	224,000	
Various	Rotterdam	New York	581,483	
Fred Stern & Co.....	London	New York	167,697	
William H. Stiles & Co.	London	New York	22,400	995,580
SEPTEMBER 30. By the S. S. "Eastern Dawn" at New York.				
Peel & Kelly, Inc.....	London	New York	354,800	
J. T. Johnstone & Co., Inc.	London	New York	58,018	
Various	Rotterdam	New York	1,086,773	1,500,591
OCTOBER 1. By the S. S. "Havana Maru" at New York.				
Peel & Kelly, Inc.....	Singapore	New York	261,000	
Pacific Trading Corporation of America.....	Singapore	New York	20,160	
Thomas A. Desmond & Co.	Singapore	New York	263,660	
L. Littlejohn & Co., Inc..	Singapore	New York	414,400	
General Rubber Co.....	Singapore	New York	268,380	
Various	Singapore	New York	31,750	1,227,600
OCTOBER 2. By the S. S. "Helenus" at New York.				
Meyer & Brown, Inc....	Colombo	New York	168,000	
Various	Colombo	New York	540,480	
Various	Tulok Anson	New York	21,420	
Meyer & Brown, Inc....	Medan	New York	217,280	
Various	Pt Swettenhm.	New York	108,180	
Various	Malacca	New York	59,220	
Various	Belawan Deli	New York	397,320	
Various	Telok Neboeng.	New York	421,560	
Baird Rubber & Trading Co.	Singapore	New York	324,800	
H. A. Astlett & Co.....	Singapore	New York	340,000	
General Rubber Co.....	Singapore	New York	828,800	
J. T. Johnstone & Co., Inc.	Singapore	New York	47,460	
L. Littlejohn & Co., Inc.	Singapore	New York	1,344,000	
Meyer & Brown, Inc....	Singapore	New York	230,720	
Fred Stern & Co.....	Singapore	New York	302,400	
Continental Rubber Co. of New York.....	Singapore	New York	100,800	
Peel & Kelly, Inc.....	Singapore	New York	33,600	
William H. Stiles & Co..	Singapore	New York	674,400	
Various	Singapore	New York	1,465,100	7,625,600
OCTOBER 2. By the S. S. "Helenus" at New York and Boston.				
Hood Rubber Co.....	London	Watertown	167,440	
Hood Rubber Co.....	Far East	Watertown	52,080	219,520
OCTOBER 2. By the S. S. "M. S. Dollar" at New York.				
C. B. Kaufman.....	Singapore	New York	270,000	
L. Littlejohn & Co., Inc.	Singapore	New York	1,176,000	
Pacific Trading Corporation of America.....	Singapore	New York	162,360	
Peel & Kelly, Inc.....	Singapore	New York	297,180	
Phelan, Borland & Fearons	Singapore	New York	343,800	
Fred Stern & Co.....	Singapore	New York	302,031	
American Trading Co...	Singapore	New York	165,240	
Baird Rubber & Trading Co.	Singapore	New York	112,000	
Various	Singapore	New York	224,289	
Various	Penang	New York	178,560	
Various	Pt. Swettenh'm.	New York	10,440	
Firestone Tire & Rubber Co.	Belawan Deli	Akron	93,780	
Hood Rubber Co.....	Far East	Watertown	22,400	3,358,080
OCTOBER 3. By the S. S. "Storm King" at New York.				
Peel & Kelly, Inc.....	Holland	New York	29,400	
Various	Rotterdam	New York	22,303	
Fred Stern & Co.....	London	New York	30,950	60,350
OCTOBER 5. By the S. S. "Kathlamba" at New York.				
General Rubber Co.....	Colombo	New York	190,400	
Meyer & Brown, Inc....	Colombo	New York	302,400	
Pablo Homs.....	Colombo	New York	81,000	
Peel & Kelly, Inc.....	Colombo	New York	24,660	
Huth & Co.....	Colombo	New York	153,720	
Fred Stern & Co.....	Colombo	New York	53,200	
Goldman, Sachs & Co...	Colombo	New York	141,480	
L. Littlejohn & Co., Inc.	Colombo	New York	71,640	
Baring Brothers.....	Colombo	New York	9,540	
H. A. Astlett & Co.....	Colombo	New York	145,000	
Various	Colombo	New York	758,420	
Baird Rubber & Trading Co.	Singapore	New York	219,520	2,150,980
OCTOBER 5. By the S. S. "Kathlamba" at Boston.				
Hood Rubber Co.....	Colombo	Watertown	156,800	156,800
OCTOBER 5. By the S. S. "Mesaba" at New York.				
William H. Stiles & Co..	London	New York	56,000	
L. Littlejohn & Co., Inc.	London	New York	448,000	504,000
OCTOBER 5. By the S. S. "Clearwater" at New York.				
Firestone Tire & Rubber Co.	Singapore	Akron	174,060	
Various	Singapore	New York	169,860	
Chas. T. Wilson Co., Inc.	Belawan	New York	79,920	
Peel & Kelly, Inc.....	Batavia	New York	764,200	
Fred Stern & Co.....	Soerabaya	New York	11,281	
Nat E. Berzen.....	Soerabaya	New York	190,620	
L. Littlejohn & Co., Inc.	London	New York	268,800	
Various	Soerabaya	New York	70,699	1,729,440
OCTOBER 6. By the S. S. "Ryndam" at New York.				
Peel & Kelly, Inc.....	Holland	New York	67,200	
Schafer & Meyer.....	Amsterdam	New York	29,574	
Jocsten & Janssen.....	Rotterdam	New York	122,760	
William H. Stiles & Co..	London	New York	44,800	
Baird Rubber & Trading Co.	Rotterdam	New York	105,280	
Meyer & Brown, Inc....	Rotterdam	New York	112,000	
Various	Rotterdam	New York	2,287,666	
Hood Rubber Co.....	London	Watertown	44,800	
Fred Stern & Co.....	London	New York	112,000	2,926,080
OCTOBER 6. By the S. S. "City of Norwich" at New York and Boston.				
Hood Rubber Co.....	London	Watertown	33,600	
Hood Rubber Co.....	Far East	Watertown	62,720	96,320
OCTOBER 6. By the S. S. "City of Norwich" at New York.				
Raw Products Co.....	Singapore	New York	90,000	
Schafer & Meyer.....	Singapore	New York	56,080	
Baird Rubber & Trading Co.	Singapore	New York	201,600	
Peel & Kelly, Inc.....	Singapore	New York	156,300	
Fred Stern & Co.....	Singapore	New York	157,538	
Continental Rubber Co. of New York.....	Singapore	New York	22,400	
J. T. Johnstone & Co., Inc.	Singapore	New York	101,910	
East Asiatic Co., Inc....	Singapore	New York	102,780	
Rubber Importers and Dealers Co., Inc.....	Singapore	New York	75,600	
Stein, Hall & Co., Inc...	Singapore	New York	138,600	
F. R. Henderson & Co..	Singapore	New York	11,340	
William H. Stiles & Co..	Singapore	New York	69,400	
C. B. Kaufman.....	Singapore	New York	5,400	
Habicht & Co.....	Singapore	New York	58,680	
Phelan, Borland & Fearons	Singapore	New York	188,820	
Jaeger & Co.....	Singapore	New York	67,320	
Meyer & Brown, Inc....	Singapore	New York	203,840	
H. A. Astlett & Co.....	Singapore	New York	360,000	
General Rubber Co.....	Singapore	New York	570,080	
Pell & Dumont, Inc.....	Singapore	New York	45,000	
Firestone Tire & Rubber Co.	Singapore	Akron	170,640	
Various	Singapore	New York	1,078,833	
Smith & Schippers, Inc.	Penang	New York	50,400	
L. Littlejohn & Co., Inc.	Colombo	New York	1,120,000	
Edward Boustead & Co..	Penang	New York	125,460	
A. C. Fox & Co.....	Penang	New York	42,120	
Various	Penang	New York	126,540	
General Rubber Co.....	Belawan Deli	New York	49,820	
Various	Belawan Deli	New York	115,780	
Various	Malacca	New York	222,660	
Meyer & Brown, Inc....	Medan	New York	56,000	5,840,980
OCTOBER 12. By the S. S. "Taketoyo Maru" at New York.				
Raw Products Co.....	Batavia	New York	25,920	
Various	Batavia	New York	216,720	
Continental Rubber Co. of New York.....	Singapore	New York	56,000	
J. T. Johnstone & Co...	Singapore	New York	205,420	
H. Muehlstein & Co.....	Singapore	New York	55,800	
Fred Stern & Co.....	Singapore	New York	33,600	
Balfour, Williamson & Co.	Singapore	New York	80,280	
John D. Lewis.....	Singapore	New York	161,640	
Various	Singapore	New York	66,920	
Baird Rubber & Trading Co.	Colombo	New York	56,000	
L. Littlejohn & Co., Inc.	Colombo	New York	338,600	1,296,900
OCTOBER 13 By the S. S. "Robert Dollar" at New York.				
C. Holdstern & Co.....	Kobe	New York	500,040	
Firestone Tire & Rubber Co.	Belawan Deli	Akron	96,840	
Eastern Rubber Co.....	Belawan Deli	New York	98,280	
The Goodyear Tire & Rubber Co.	Belawan Deli	Akron	403,920	
H. T. Carey & Co.....	Pt Swettenh'm.	New York	18,000	
John D. Lewis.....	Singapore	New York	269,100	

PLANTATIONS—Continued

	Shipment from:	Shipped to:	Pounds	Totals
Firestone Tire & Rubber Co.	Singapore	Akron	199,440	
The Goodyear Tire & Rubber Co.	Singapore	Akron	94,500	
Continental Rubber Co. of New York	Singapore	New York	67,200	
Poel & Kelly, Inc.	Singapore	New York	332,300	
Peninsular Trading Agency, Inc.	Singapore	New York	129,060	
Chas. T. Wilson Co., Inc.	Singapore	New York	172,440	
Nat E. Berzen	Singapore	New York	149,400	
Wm. Brandt's Sons & Co.	Singapore	New York	75,960	
L. Littlejohn & Co., Inc.	Singapore	New York	414,400	
William H. Stiles & Co.	Singapore	New York	134,800	
Baird Rubber & Trading Co.	Singapore	New York	199,360	
H. A. Astlett & Co.	Singapore	New York	110,000	
Thomas A. Desmond & Co.	Singapore	New York	123,480	
Fred Stern & Co.	Singapore	New York	22,400	
Various	Singapore	New York	189,680	
Hood Rubber Co.	London	Watertown	22,400	
Hood Rubber Co.	Far East	Watertown	26,880	3,849,480
OCTOBER 15. By the S. S. "Muroran Maru" at New York.				
General Rubber Co.	Colombo	New York	313,600	
Habicht & Co.	Colombo	New York	21,780	
Various	Colombo	New York	122,360	457,740
OCTOBER 15. By the S. S. "Nieuw Amsterdam" at New York.				
Federal Rubber Co.	Rotterdam	New York	180	
Meyer & Brown, Inc.	Rotterdam	New York	44,800	
Various	Rotterdam	New York	903,560	
L. Littlejohn & Co., Inc.	London	New York	291,200	
Fred Stern & Co.	London	New York	38,080	1,277,820
OCTOBER 16. By the S. S. "Maine" at New York.				
Goldman, Sachs & Co.	London	New York	55,260	
L. Littlejohn & Co., Inc.	London	New York	448,000	
Fred Stern & Co.	London	New York	33,600	
Continental Rubber Co. of New York	London	New York	78,400	
Various	London	New York	40,660	655,920
By the S. S. "West Henshaw" at Los Angeles.				
H. A. Astlett & Co.	Singapore	New York	170,000	170,000
OCTOBER 17. By the S. S. "Ocean Monarch" at New York.				
Fred Stern & Co.	Singapore	New York	56,000	
Schafer & Meyer	Singapore	New York	56,000	
Wm. Brandt's Sons & Co.	Singapore	New York	78,460	
Ed. Boustead & Co.	Singapore	New York	56,836	
Various	Singapore	New York	78,510	325,806

*299,160 lbs. short shipped.

PONTIANAK

OCTOBER 1. By the S. S. "Havana Maru" at New York.				
Fred Stern & Co.	Singapore	New York	25,860	25,860
OCTOBER 2. By the S. S. "Helenus" at New York.				
Various	Colombo	New York	177,300	177,300
OCTOBER 2. By the S. S. "M. S. Dollar" at New York.				
Various	Singapore	New York	76,500	76,500
OCTOBER 6. By the S. S. "City of Norwich" at New York.				
Russell & Co.	Singapore	New York	2,100	
Various	Singapore	New York	228,000	230,100
OCTOBER 13. By the S. S. "Robert Dollar" at New York.				
Various	Pt. Swet'nh'm	New York	47,700	47,700

CENTRALS

SEPTEMBER 21. By the S. S. "General H. F. Hodges" at New York.				
Mecke & Co.	Cristobal	New York	2,400	
G. Amsinck & Co., Inc.	Cristobal	New York	3,450	5,850
SEPTEMBER 23. By the S. S. "Santa Marta" at New York.				
G. Amsinck & Co., Inc.	Puerto Col'm'a	New York	5,400	5,400
OCTOBER 18. By the S. S. "Mayaro" at New York.				
Various	Cristobal	New York	1,200	1,200

AFRICANS

OCTOBER 1. By the S. S. "Scythia" at New York.				
Fred Stern & Co.	Liverpool	New York	9,103	9,103
OCTOBER 9. By the S. S. "Zeeland" at New York.				
Various	Antwerp	New York	52,095	52,095
OCTOBER 17. By the S. S. "Kroonland" at New York.				
Various	Antwerp	New York	31,970	31,970

GUTTA PERCHA

OCTOBER 1. By the S. S. "Havana Maru" at New York.				
Fred Stern & Co.	Singapore	New York	22,400	22,400
OCTOBER 2. By the S. S. "Helenus" at New York.				
Various	Colombo	New York	40,800	40,800
OCTOBER 12. By the S. S. "Taketoyo Maru" at New York.				
John D. Lewis	Singapore	New York	37,800	37,800

BALATA

	Shipment from:	Shipped to:	Pounds	Totals
SEPTEMBER 23. By the S. S. "Santa Marta" at New York.				
Eggers & Heinlein	Puerto Col'm'a	New York	3,000	3,000
SEPTEMBER 25. By the S. S. "Lake Savus" at New York.				
Middleton & Co., Limited	French Guiana	New York	30,652	30,652
OCTOBER 1. By the S. S. "Matura" at New York.				
Middleton & Co., Limited	French Guiana	New York	1,980	1,980
OCTOBER 2. By the S. S. "Commewyne" at New York.				
Middleton & Co., Limited	Surinam	New York	16,523	
William Schall & Co.	West Indies	New York	7,200	
Curaçao Trading Co.	West Indies	New York	6,600	30,323
OCTOBER 7. By the S. S. "Tivives" at New York.				
G. Amsinck & Co., Inc.	Colombo	New York	2,400	2,400
OCTOBER 13. By the S. S. "Sixola" at New York.				
American Trading Co.	Columbia	New York	17,250	17,250
OCTOBER 17. By the S. S. "Ulua" at New York.				
Ultramares Corporation.	Cristobal	Hamburg	14,377	14,377
OCTOBER 18. By the S. S. "Mayaro" at New York.				
Yglesias & Co.	Cristobal	New York	14,100	
Ultramares Corporation.	Cristobal	New York	13,800	
Middleton & Co., Limited	Cristobal	New York	6,600	34,500

ANTWERP RUBBER ARRIVALS

September 27. By the S. S. *Mayumbe*, from the Congo.		
Société Anonyme Bungé (Intertropical-Comfina)	*kilos*	72,730
Société Anonyme Bungé (Comptoir Colonial Belgika)		10,500
Société Anonyme Bungé		10,568
Credit Colonial & Commercial (Anc. L. & W. Van de Velde) (Intertropical-Comfina)		19,700
Société Coloniale Anversoise (S. A. B.)		470
Messrs. Feter Frères		6,000
Messrs. Osterrieth & Co.		2,500
Various		12,480
Totals	*kilos*	134,948

Compiled by Grisar & Co., Antwerp.

CUSTOM HOUSE STATISTICS

NEW YORK

IMPORTS

	August 1920 Pounds	August 1920 Value	August 1921 Pounds	August 1921 Value
UNMANUFACTURED—*free*				
Crude rubber				
From Belgium	21,243	$10,453	.....	.....
Netherlands	122,932	50,526	3,137,203	$519,517
Portugal	69,237	25,859	42,864	8,672
England	1,959,765	793,200	3,316,792	470,964
Ireland	.....	.....	78,239	15,971
Costa Rica	1,623	325	.....	.....
Nicaragua	23,615	10,573	.....	.....
Panama	1,530	918	.....	.....
Mexico	19,133	4,649	.....	.....
Bolivia	15,000	5,643	.....	.....
Brazil	1,317,139	325,547	1,339,406	122,834
Colombia	242,994	67,624	7,298	2,199
Ecuador	10,900	2,420	.....	.....
Peru	114,405	25,095	.....	.....
Uruguay	10,911	3,409	.....	.....
China	44,450	23,680	82,600	9,778
British India	270,000	97,516	39,200	5,880
Straits Settlements	26,191,776	12,322,176	16,134,887	2,370,114
British East Indies	4,052,341	1,787,894	3,717,344	495,428
Dutch East Indies	3,985,146	1,686,826	2,175,244	409,817
Hongkong	22,348	12,538	.....	.....
Japan	929,600	385,610	470,400	65,738
British Oceania	959	367	.....	.....
Philippine Islands	15,540	5,400	.....	.....
British East Africa	7,733	3,136	.....	.....
Totals	39,450,320	$17,651,384	30,541,477	$4,496,912
Balata	41,222	25,978	88,171	58,399
Jelutong (Pontianak)	2,874,901	540,107	324,221	17,061
Gutta percha	1,410,791	369,448	468,275	70,565
Totals	43,777,234	$18,586,917	31,422,144	$4,642,937
Rubber scrap and reclaimed	391,133	59,588	113,966	9,528
Totals, unmanufactured	44,168,367	$18,646,505	31,536,110	$4,652,465
Manufactures of rubber and gutta percha—*dutiable*	.....	$130,068	.....	$45,962
Chicle—*dutiable*	264,911	181,647	132,213	65,858

EXPORTS

	August 1920 Pounds	August 1920 Value	August 1921 Pounds	August 1921 Value
MANUFACTURED				
Automobile and other tires	.....	$2,243,385	.....	$835,570
Inner tubes	.....	211,916	.....	80,438
Belting, hose and packing	.....	352,494	.....	140,506
Rubber boots and shoes, *pairs*	370,200	369,738	152,480	175,135
Soles and heels	.....	42,853	.....	18,385
Druggists' sundries	.....	94,928	.....	37,995
Other rubber manufactures	.....	275,869	.....	150,335
Totals, manufactured	.....	$3,591,183	.....	$1,438,364
Insulated wire	.....	$261,911	.....	273,193
UNMANUFACTURED—*free*				
Rubber scrap and reclaimed	106,466	$12,515	605,422	$32,336

FOREIGN EXPORTS

Crude rubber	336,809	$137,257	15,316	$2,142
Balata	99,778	50,640	2,240	850
Rubber scrap and reclaimed	224,330	44,831	.....	.....
Rubber manufactures	.....	.....	.....	1,214
Chicle	309	270	938	342

MASSACHUSETTS

IMPORTS

UNMANUFACTURED—*free*				
Crude rubber				
From Straits Settlements	7,000	$3,114	.....	.....
British East Indies	93,311	21,562	393,030	$37,717
England	.....	.....	169,949	17,290
Totals	100,311	$24,676	562,979	$55,007
Rubber scrap and reclaimed	96,839	6,413	.....	.....
Totals, unmanufactured	197,150	$31,089	562,979	$55,007
Rubber manufactures, *dutiable*	.....	$90,184	.....	$2,081

EXPORTS

MANUFACTURED				
Automobile and other tires	.....	$7,416	.....	$1,268
Inner tubes	.....	11,269	.....	11
Belting, hose, and packing	.....	4,482	.....	726
Rubber boots and shoes, *pairs*	89,931	99,188	10,172	11,419
Soles and heels	.....	7,114	.....	656
Druggists' sundries	.....	3,980	.....	40
Other rubber manufactures	.....	64,812	.....	17,790
Totals, manufactured	.....	$198,261	.....	$31,910
Insulated wire	.....	$15,820	.....	.....
Rubber scrap and reclaimed	1,571	550	.....	.....

BUFFALO

IMPORTS

UNMANUFACTURED—*free*				
Crude rubber				
From Canada	152	$67	200	$57
Totals	152	$67	200	$57
Rubber scrap and reclaimed	540,319	26,189	100,803	3,448
Totals, unmanufactured	540,471	$26,256	101,003	$3,505
Rubber manufactures, *dutiable*	.....	$2,936	.....	$9,302
Chicle, *dutiable*	3	3	.....	.....

EXPORTS

MANUFACTURED				
Automobile and other tires	.....	$126,692	.....	$16,125
Inner tubes	.....	12,348	.....	757
Belting, hose, and packing	.....	7,076	.....	7,363
Rubber boots and shoes, *pairs*	585	1,329	.....	.....
Soles and heels	.....	958	.....	38
Druggists' sundries	.....	8,994	.....	5,380
Other rubber manufactures	.....	98,196	.....	54,831
Totals, manufactured	.....	$255,593	.....	$84,494
Insulated wire	.....	$3,462	.....	$3,655
Rubber scrap and reclaimed	246,219	42,719	152,554	16,478

FOREIGN EXPORTS

Crude rubber	302,492	$88,619	811,741	$178,066
Balata	.....	.....	199	140

PHILADELPHIA

IMPORTS

Rubber manufactures, *dutiable*	.....	.....	.....	$1,176

EXPORTS

MANUFACTURED				
Automobile and other tires	.....	$208,426	.....	$3,117
Inner tubes	.....	20,774	.....	310
Belting, hose, and packing	.....	71,301	.....	5,135
Rubber boots and shoes, *pairs*	800	1,051	.....	.....
Soles and heels	.....	1,263	.....	.....
Other rubber manufactures	.....	10,234	.....	3,957
Totals, manufactured	.....	$313,049	.....	$12,519
Insulated wire	.....	$26,737	.....	.....
Rubber scrap and reclaimed	45,290	8,071	5,339	$293

NEW ORLEANS

EXPORTS

	August 1920 Pounds	August 1920 Value	August 1921 Pounds	August 1921 Value
MANUFACTURED				
Automobile and other tires	.....	$58,197	.....	$9,597
Inner tubes	.....	7,292	.....	1,486
Belting, hose, and packing	.....	16,372	.....	3,288
Rubber boots and shoes, *pairs*	13,559	15,814	17,232	24,155
Soles and heels	.....	1,130	.....	725
Druggists' sundries	.....	11	.....	329
Other rubber manufactures	.....	2,393	.....	415
Totals, manufactured	.....	$101,209	.....	$39,995
Insulated wire	.....	$10,688	.....	$1,778

OHIO

IMPORTS

UNMANUFACTURED—*free*				
Crude rubber				
From Straits Settlements	2,488,754	$1,349,842	.....	.....
Totals, unmanufactured	2,488,754	$1,349,842	.....	.....
Rubber manufactures, *dutiable*	.....	$845	.....	$517

EXPORTS

MANUFACTURED				
Automobile and other tires	.....	.....	.....	$64,137
Inner tubes	.....	.....	.....	15,922
Other rubber manufactures	.....	.....	.....	521
Totals, manufactured	.....	.....	.....	$80,580

SAN FRANCISCO

IMPORTS

UNMANUFACTURED—*free*				
Crude rubber				
From Straits Settlements	1,033,170	$656,945	601,686	$94,484
British India	.....	.....	254	94
French East Indies	.....	.....	4,638	719
Totals, unmanufactured	1,033,170	$656,945	606,578	$95,297
Rubber manufactures, *dutiable*	.....	$1,581	.....	$614

EXPORTS

MANUFACTURED				
Automobile and other tires	.....	$127,117	.....	$52,218
Inner tubes	.....	8,897	.....	1,329
Belting, hose, and packing	.....	69,072	.....	22,804
Rubber boots and shoes, *pairs*	1,944	2,213	2,360	2,944
Soles and heels	.....	6,484	.....	596
Druggists' sundries	.....	4,743	.....	1,293
Other rubber manufactures	.....	18,012	.....	3,071
Totals, manufactured	.....	$236,538	.....	$84,255
Insulated wire	.....	$6,910	.....	$1,179
Rubber scrap and reclaimed	.....	.....	75,680	1,110

WASHINGTON

IMPORTS

UNMANUFACTURED—*free*				
Crude rubber				
From Straits Settlements	223,000	$75,847	.....	.....
Japan	89,760	32,328	22,500	$3,825
Total, unmanufactured	312,760	$108,175	22,500	$3,825
Rubber manufactures, *dutiable*	.....	.....	.....	$40

EXPORTS

MANUFACTURED				
Automobile and other tires	.....	$51,427	.....	$6,760
Inner tubes	.....	6,036	.....	48
Belting, hose, and packing	.....	56,462	.....	718
Rubber boots and shoes, *pairs*	244	982	432	1,217
Druggists' sundries	.....	80	.....	346
Other rubber manufactures	.....	3,347	.....	4,146
Totals, manufactured	.....	$118,334	.....	$13,235
Insulated wire	.....	$119	.....	.....
Rubber scrap and reclaimed	1,065	32	23,289	$619

FOREIGN EXPORTS

Crude rubber	1,000	$376	.....	.....

CHICAGO

IMPORTS

Rubber manufactures, *dutiable*	.....	$18,072	.....	$2,695
Chicle, *dutiable*	256,824	172,724	151,786	76,276

MICHIGAN

IMPORTS

Rubber scrap and reclaimed	.....	.....	87,400	$1,546
Rubber manufactures, *dutiable*	.....	.....	.....	1,931

EXPORTS

MANUFACTURED				
Automobile and other tires	.....	.....	.....	$3,439
Inner tubes	.....	.....	.....	763
Belting, hose, and packing	.....	.....	.....	6,832
Rubber boots and shoes, *pairs*	.....	.....	1,980	6,665
Druggists' sundries	.....	.....	.....	248
Other rubber manufactures	.....	.....	.....	10,605
Totals, manufactured	.....	.....	.....	$28,552
Insulated wire	.....	.....	.....	$2,545
Rubber scrap and reclaimed	.....	.....	4,012	461

EXPORTS OF INDIA RUBBER MANUFACTURES AND INSULATED WIRE AND CABLE FROM THE UNITED STATES BY COUNTRIES, DURING THE MONTH OF JUNE, 1921

EXPORTED TO—				Boots		Shoes			Automobile Tires							
EUROPE	Belting Value	Hose Value	Packing Value	Pairs	Value	Pairs	Value	Soles and Heels Value	Casings Value	Inner Tubes Value	Solid Tires Value	All Others Value	Insulated Wire and Cables Value	Druggists' Rubber Sundries Value	All Other Manufactures of Rubber Value	Totals Value
Azores and Madeira Islands	.....	$135	$29	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	$164
Belgium	.....	.....	94	.....	.....	.....	.....	.....	$5,264	$658	.....	.....	.....	$67	$1,633	7,716
Denmark	$1,219	50	240	.....	.....	5,304	$6,284	$192	40,726	1,146	$1,003	$552	$1,613	67	1,685	54,777
Finland	3,480	600	.....	.....	.....	48	40	55	2,523	438	.....	.....	485	.....	261	7,882
France	8,091	1,305	.....	.....	.....	.....	.....	60	61,923	215	.....	22	1,103	.....	31,409	104,128
Germany	.....	15	.....	.....	.....	.....	.....	.....	290	29	.....	.....	.....	.....	255	589
Greece	.....	.....	.....	.....	.....	.....	.....	35	9,640	807	.....	.....	.....	.....	300	10,783
Iceland and Faroe Islands	.....	.....	.....	.....	.....	.....	.....	.....	3,105	44	.....	.....	.....	.....	.....	3,149
Italy	.....	.....	.....	.....	.....	.....	.....	302	1,489	.....	.....	.....	993	.....	.....	2,784
Netherlands	327	409	.....	.....	.....	.....	.....	804	6,473	310	.....	720	1,736	1,544	696	13,010
Norway	9,000	.....	.....	.....	.....	.....	.....	212	4,775	176	935	.....	5,126	.....	510	20,734
Poland and Danzig	.....	.....	.....	.....	.....	.....	.....	.....	1,640	.....	850	.....	40,000	.....	.....	42,490
Portugal	.....	.....	.....	.....	.....	.....	.....	.....	430	.....	.....	.....	120	.....	.....	550
Rumania	.....	.....	.....	.....	.....	960	2,200	.....	.....	.....	563	.....	.....	.....	.....	2,763
Spain	.....	2,493	.....	.....	.....	72	110	.....	2,531	217	1,547	.....	5,408	.....	1,328	13,734
Sweden	344	1,643	19	780	$2,145	.....	.....	.....	4,020	1,037	2,534	.....	277,001	.....	3,136	291,878
Switzerland	.....	.....	.....	.....	.....	4,056	3,991	.....	1,242	60	.....	.....	.....	.....	.....	5,293
Turkey in Europe	.....	.....	.....	.....	.....	480	1,100	.....	953	211	.....	.....	.....	.....	1,125	3,389
England	1,172	945	511	.....	.....	1,319	2,071	621	190,360	6,139	10,713	5,796	9,803	10,675	93,493	332,299
Scotland	.....	.....	1,740	.....	.....	840	828	.....	.....	.....	.....	.....	24,400	35	40,833	67,836
Ireland	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,596	.....	1,596
TOTALS, EUROPE	$23,633	$7,585	$2,633	780	$2,145	13,079	$16,624	$2,282	$337,384	$11,487	$13,245	$7,090	$367,788	$13,984	$176,664	$987,544
NORTH AMERICA																
Bermuda	$6	$98	$100	.....	.....	415	$695	$357	.....	.....	.....	.....	$273	$308	$320	$2,157
British Honduras	21	.....	47	.....	.....	942	1,453	91	$188	$41	.....	.....	.....	.....	10	1,851
Canada	18,357	7,156	4,347	1,059	$3,622	3,139	5,293	198	34,744	3,587	$3,660	$1,301	16,833	10,097	126,833	235,928
Costa Rica	595	.....	178	.....	.....	.....	.....	1,148	445	471	.....	.....	1,872	208	233	5,100
Guatemala	462	.....	429	800	2,300	222	368	373	547	50	225	29	378	85	460	5,706
Honduras	1,023	2,660	770	.....	.....	1,118	1,706	209	1,074	79	1,242	.....	702	165	146	9,776
Nicaragua	1,277	99	281	.....	.....	33	66	.....	.....	.....	.....	.....	1,455	43	55	3,276
Panama	782	3,068	118	24	76	3,722	5,000	1,625	5,248	1,021	1,466	916	12,582	1,363	2,271	35,536
Salvador	31	81	22	.....	.....	.....	.....	459	2,627	23	.....	.....	105	.....	239	3,587
Mexico	27,930	25,247	9,455	4	25	28,085	34,228	7,115	111,312	13,580	3,497	10,621	21,032	9,026	22,836	295,904
Miquelon, Langley, etc.	.....	.....	.....	529	1,957	.....	.....	.....	.....	.....	.....	.....	.....	.....	16	1,973
Newfoundland and Labrador	.....	298	.....	1,903	5,669	339	221	142	7,887	1,015	.....	40	1,505	81	347	17,205
Barbados	.....	.....	.....	.....	.....	24	42	.....	1,468	405	296	.....	.....	.....	95	2,216
Jamaica	.....	340	196	.....	.....	1,770	1,923	30	9,055	771	8,518	425	1,439	441	458	23,596
Trinidad and Tobago	1,061	560	372	.....	.....	312	369	.....	9,517	936	1,446	169	1,047	.....	600	16,077
Other British West Indies	.....	27	21	.....	.....	839	940	334	2,260	632	13	289	85	.....	48	4,649
Cuba	1,091	7,993	4,750	36	98	4,338	5,118	6,922	33,047	7,557	16,968	338	34,537	4,144	12,755	135,318
Virgin Islands of United States	.....	.....	.....	.....	.....	453	811	91	412	121	949	.....	1,419	.....	133	3,936
Dutch West Indies	.....	.....	.....	.....	.....	607	772	138	302	.....	.....	.....	.....	.....	.....	1,212
French West Indies	.....	.....	.....	.....	.....	.....	.....	.....	221	.....	.....	.....	.....	.....	.....	221
Haiti	.....	99	.....	.....	.....	74	100	67	2,501	159	.....	.....	24	12	152	3,114
Dominican Republic	3,374	1,064	489	.....	.....	536	752	205	15,793	905	300	.....	495	778	393	24,553
TOTALS, NORTH AMERICA	$56,000	$48,790	$21,535	4,355	$13,747	46,968	$59,857	$19,504	$238,653	$31,353	$38,490	$14,028	$95,783	$26,751	$168,400	$832,891
OCEANIA																
Australia	$2,332	$328	$2,335	.....	.....	.....	.....	.....	$1,799	$575	$2,329	.....	$5,266	$1,563	$4,941	$21,468
New Zealand	370	938	936	.....	.....	.....	.....	.....	25,177	376	1,365	.....	8,923	640	3,234	41,959
Other British Oceania	.....	25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	25
French Oceania	.....	.....	31	.....	.....	349	$464	.....	1,210	166	1,220	.....	.....	.....	6	3,097
Other Oceania	.....	.....	.....	.....	.....	288	383	.....	75	24	.....	.....	.....	.....	15	497
Philippine Islands	7,747	1,798	181	.....	.....	2,976	4,498	$1,794	24,253	4,146	28,836	$7,845	3,728	354	3,127	88,307
TOTALS, OCEANIA	$10,449	$3,089	$3,483	.....	.....	3,613	$5,345	$1,794	$52,514	$5,287	33,750	$7,845	$17,917	$2,557	$11,323	$155,353
SOUTH AMERICA																
Argentina	$2,144	$516	$66	.....	.....	.....	.....	$3,022	$7,365	$464	$619	.....	$5,735	$1,683	$3,150	$24,758
Bolivia	.....	848	.....	.....	.....	.....	.....	.....	.....	304	.....	.....	15	.....	.....	1,167
Brazil	4,711	493	448	.....	.....	.....	.....	536	.....	.....	436	.....	18,974	433	409	26,460
Chile	251	75	243	.....	.....	.....	.....	349	13,381	2,997	.....	.....	2,002	.....	2,251	21,549
Colombia	409	315	.....	.....	.....	109	$94	1,149	1,100	301	.....	.....	27,395	624	231	31,678
Ecuador	.....	98	48	.....	.....	.....	.....	.....	2,839	.....	.....	.....	928	.....	117	4,030
Falkland Islands	.....	.....	.....	.....	.....	.....	.....	.....	.....	486	.....	.....	.....	.....	.....	486
British Guiana	.....	102	.....	.....	.....	72	73	.....	2,433	.....	.....	$45	201	.....	226	3,080
Dutch Guiana	.....	.....	.....	.....	.....	200	236	32	.....	.....	.....	.....	.....	.....	92	360
Paraguay	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	612	.....	.....	612
Peru	25	2,785	56	24	$180	36	22	.....	3,985	550	636	.....	9,794	.....	504	18,537
Uruguay	.....	.....	67	.....	.....	.....	.....	.....	2,721	356	.....	.....	620	.....	75	3,839
Venezuela	.....	1,030	243	.....	.....	.....	.....	76	6,284	659	49	592	1,297	.....	236	10,466
TOTALS, SOUTH AMERICA	$7,540	$6,316	$1,171	24	$180	417	$425	$5,164	$46,108	$6,117	$1,760	$637	$67,573	$2,740	$7,291	$147,022

Exported to—	Belting Value	Hose Value	Packing Value	Boots Pairs	Boots Value	Shoes Pairs	Shoes Value	Soles and Heels Value	Automobile Tires: Casings Value	Automobile Tires: Inner Tubes Value	Automobile Tires: Solid Tires Value	Automobile Tires: All Others Value	Insulated Wire and Cables Value	Druggists' Rubber Sundries Value	All Other Manufactures of Rubber Value	Totals Value
Asia																
China	$2,807	$159	$72	......	......	550	$556	......	$22,303	$294	......	......	$21,708	$495	$5,471	$53,875
Kwantung, leased territory	......	......	......	......	......	576	578	......	......	......	......	......	......	......	......	578
Chosen	51	32	3	......	......	......	......	......	......	......	......	......	......	141	......	227
British India	3,712	1,310	......	1	$7	......	......	......	2,713	1,012	$6,244	......	1,591	313	1,418	18,320
Straits Settlements	......	......	......	......	......	......	......	......	11,325	776	6,236	......	......	......	171	18,528
Dutch East Indies	688	101	450	......	......	......	......	......	17,038	1,692	23,576	$300	937	166	5,029	49,977
Portuguese East Indies	......	......	......	......	......	......	......	......	......	......	......	......	......	33	......	33
Hongkong	......	224	......	......	......	918	740	......	1,957	115	......	......	......	68	139	3,243
Japan	4,373	4,178	6,590	5,136	13,148	19,584	18,908	......	20,923	853	6,666	1,015	1,690	1,250	22,062	101,656
Persia	......	......	......	......	......	1,986	2,388	......	......	......	......	......	......	......	1,300	3,688
Russia in Asia	......	......	......	......	......	......	......	......	......	......	......	......	......	30	......	30
Siam	......	......	......	......	......	......	......	......	......	......	......	......	830	......	28	858
Turkey in Asia	......	......	......	......	......	48	62	......	5,348	516	1,572	......	......	......	1,280	8,778
Totals, Asia	$11,631	$6,014	$7,115	5,137	$13,155	23,662	$23,232	......	$81,607	$5,258	$44,314	$1,315	$26,756	$2,496	$36,898	$259,791
Africa																
British West Africa	......	......	......	......	......	......	......	......	$1,888	$863	$540	......	......	......	......	$3,291
British South Africa	$9,074	$4,456	......	......	......	1,056	$753	$1,739	3,420	......	......	......	$12,342	$61	$2,582	34,427
British East Africa	......	......	......	......	......	......	......	......	1,414	212	......	......	......	......	......	1,626
Canary Islands	......	......	......	......	......	......	......	......	761	......	344	......	......	......	......	1,105
French Africa	......	292	$42	......	......	......	......	......	......	......	......	......	......	......	......	334
Morocco	......	......	......	......	......	......	......	......	......	......	572	......	......	......	......	572
Egypt	......	......	......	......	......	......	......	......	769	43	......	......	52	96	263	1,223
Totals, Africa	$9,074	$4,748	$42	......	......	1,056	$753	$1,739	$8,252	$1,118	$1,456	......	$12,394	$157	$2,845	$42,578
Grand Totals	$118,327	$76,542	$35,979	10,296	$29,227	88,795	$106,236	$30,483	$758,518	$60,620	$138,015	$30,915	$588,211	$48,685	$403,421	$2,425,179

EXPORTS OF RUBBER GOODS TO NON-CONTIGUOUS TERRITORY OF THE UNITED STATES

	Belting, Hose and Packing Value	Boots and Shoes Pairs	Boots and Shoes Value	Tires: Automobile Value	Tires: All Others Value	Insulated Wire and Cables Value	Druggists' Rubber Sundries Value	All Other Manufactures of Rubber Value	Totals Value
Hawaii	$11,182	......	......	$91,472	$447	......	......	$21,876	$124,977
Porto Rico	2,720	......	......	56,869	1,554	......	......	4,910	66,053
Totals	$13,902	......	......	$148,341	$2,001	......	......	$26,786	$191,030

Compiled by the Bureau of Foreign Commerce, Department of Commerce, Washington, D. C.

OFFICIAL INDIA RUBBER STATISTICS FOR THE UNITED STATES

IMPORTS OF CRUDE AND MANUFACTURED RUBBER

June	1920 Pounds	1920 Value	1921 Pounds	1921 Value
Unmanufactured—*free*				
India rubber				
From France	275,975	$80,334	......	......
Netherlands	1,928,772	904,276	941,378	$174,884
Portugal	598,664	123,667	......	......
United Kingdom	5,660,375	2,434,051	1,357,917	211,549
Canada	307,781	318,811	......	......
Central America	15,331	4,389	......	......
Mexico	20,357	13,025	......	......
Brazil	2,264,845	631,506	2,215,989	242,286
Peru	......	......	22,594	2,431
Other South Am.	124,998	42,917	409,236	46,867
British E. Indies	26,265,065	12,639,688	25,546,836	4,379,361
Dutch E. Indies	5,855,954	2,683,692	3,793,568	732,174
Other countries	220,606	84,951	337,230	42,265
Totals	43,538,723	$19,961,307	34,624,748	$5,831,817
Balata	141,683	$88,261	124,832	$72,661
Guayule	224,982	39,327	......	......
Jelutong (Pontianak)	1,202,096	203,113	249,236	11,541
Gutta percha	645,880	120,551	217,231	29,563
Rubber scrap	1,145,902	83,550	298,941	5,507
Totals, unmanufactured	46,899,266	$20,496,109	35,514,988	$5,951,089
India rubber and gutta percha ....*dutiable*	......	$144,009	......	$81,608
India rubber substitutes, *dutiable*	464	175	......	......
Chicle ....*dutiable*	1,413,125	903,710	727,671	409,212

EXPORTS OF DOMESTIC MERCHANDISE

	1920 Pounds	1920 Value	1921 Pounds	1921 Value
Manufactured—				
India rubber				
Scrap and old	736,559	$64,026	421,643	$22,724
Reclaimed	488,749	78,424	46,323	6,103
Belting[1]	......	289,271	......	118,327
Hose[1]	......	225,026	......	76,542
Packing[1]	......	104,615	......	35,979
Boots[1] ....*pairs*	15,744	57,020	10,296	29,227
Shoes[1] ....*pairs*	749,154	720,684	88,795	106,236
Soles and heels[1]	......	74,309	......	30,483
Tires				
Casings[1]	......	3,186,857	......	758,518
Inner tubes[1]	......	474,240	......	60,620
Solid tires[1]	......	283,248	......	138,015
All other tires[1]	......	75,277	......	30,915
Druggists' rubber sundries[1]	......	129,485	......	48,685
Other rubber manufactures[1]	......	852,904	......	403,421
Suspenders and garters	......	449,264	......	49,578
Totals, manufactured	......	$7,064,650	......	$1,915,373

EXPORTS OF FOREIGN MERCHANDISE

	1920 Pounds	1920 Value	1921 Pounds	1921 Value
Unmanufactured—				
India rubber	432,906	$157,820	735,122	$132,196
Balata	9,743	6,574	5,326	2,623
Guayule	50	43	......	......
Jelutong (Pontianak)	53,071	9,975	......	......
Rubber scrap	781	234	224,283	31,400
Totals, unmanufactured	496,551	$174,646	964,731	$166,219
Manufactured—				
Gutta percha and india rubber	......	$4,664	......	......
Totals, manufactured	......	$4,664	......	......

EXPORTS OF RUBBER GOODS TO NON-CONTIGUOUS TERRITORIES OF THE UNITED STATES

	1920 Pounds	1920 Value	1921 Pounds	1921 Value
Manufactured—				
To Alaska				
Belting, hose, and packing	......	$10,268	......	$8,409
Boots and shoes...*pairs*	4,454	13,591	8,194	26,341
Other rubber goods	......	5,165	......	6,288
Totals	......	$29,024	......	$41,038
To Hawaii				
Belting, hose, and packing	......	$14,789	......	$11,182
Automobile tires	......	101,425	......	91,472
Other tires	......	6,056	......	447
Other rubber goods	......	19,469	......	21,876
Totals	......	$141,739	......	$124,977
To Porto Rico				
Belting, hose, and packing	......	$5,693	......	$2,720
Automobile tires	......	66,068	......	56,869
Other tires	......	8,149	......	1,554
Other rubber goods	......	17,968	......	17,695
Totals	......	$97,878	......	$78,838

[1]Details of exports of domestic merchandise by countries during June, 1921, appear on this and the preceding page.

IMPORTS OF CRUDE RUBBER INTO THE UNITED STATES BY CUSTOMS DISTRICTS

	September, 1921	
CUSTOMS DISTRICTS	Pounds	Value
Massachusetts	313,940	$29,569
New York	33,628,864	4,630,805
Los Angeles	166,121	18,513
San Francisco	253,521	38,318
Oregon	11,049	1,600
San Francisco	172,916	31,729
Totals	34,546,411	$4,750,534

RUBBER STATISTICS FOR THE DOMINION OF CANADA

IMPORTS OF CRUDE AND MANUFACTURED RUBBER

	July			
	1920		1921	
UNMANUFACTURED—*free*	Pounds	Value	Pounds	Value
Rubber, gutta percha, etc.:				
From United Kingdom	519,666	$267,454	40,237	$6,695
United States	233,669	70,665	881,929	132,140
British East Indies—				
India	5,000	1,776	.....	.....
Straits Settlements	256,487	102,502	114,240	39,576
Other countries	5,352	2,166	.....	.....
Total	1,020,174	$444,563	1,036,406	$178,411
Balata	25	46	.....	.....
Rubber, recovered	202,148	32,347	47,976	8,082
Rubber, powdered, and rubber or gutta percha scrap	67,868	3,336	58,577	7,612
Rubber substitutes	154,244	23,326	3,780	376
Totals, unmanufactured	1,444,459	$503,618	1,146,739	$194,481
PARTLY MANUFACTURED—				
Hard rubber sheets and rods	39,866	$29,248	111	$79
Hard rubber tubes	.....	5,979	.....	2,020
Rubber thread, not covered	14,089	17,315	4,803	5,912
Totals, partly manufactured	53,955	$52,542	4,914	$8,011
MANUFACTURED—				
Belting	.....	$13,038	.....	$15,337
Hose	.....	11,288	.....	10,792
Packing	.....	7,511	.....	4,271
Boots and shoes	.....	10,020	.....	3,557
Clothing, including waterproofed	.....	21,525	.....	13,408
Gloves	.....	1,891	.....	913
Hot-water bottles	.....	1,866	.....	101
Tires, solid	.....	15,968	.....	10,064
Tires, pneumatic	.....	67,612	.....	91,206
Inner tubes	.....	10,832	.....	10,451
Elastic, round or flat	.....	47,081	.....	24,639
Mats and matting	.....	437	.....	254
Cement	.....	5,862	.....	3,026
Other rubber manufactures	.....	174,476	.....	94,117
Totals, manufactured	.....	$389,407	.....	$282,136
Totals, rubber imports	1,498,414	$945,567	1,151,653	$484,628
Insulated wire and cables—				
Wire and cables covered with cotton, linen, silk, rubber, etc.	.....	$24,847	.....	$6,061
Copper wire and cables, covered as above	.....	16,492	.....	15,555
Chicle	42,749	32,818	49,909	22,821
Fillets	.....	296	.....	1,340
Webbing	.....	85,190	.....	36,642
Fountain pens	.....	4,945	.....	2,286

EXPORTS OF DOMESTIC AND FOREIGN RUBBER GOODS

	July			
	1920		1921	
UNMANUFACTURED—	Produce of Canada Value	Reexports of Foreign Goods Value	Produce of Canada Value	Reexports of Foreign Goods Value
Crude and waste rubber	$26,438	.....	$6,558	$55
MANUFACTURED—				
Belting	$3,982	.....	$344	.....
Hose	25,559	.....	7,118	.....
Boots and shoes	116,214	.....	28,807	.....
Clothing, including waterproofed	4,839	.....	836	$223
Tires, pneumatic	906,498	.....	197,914	.....
Tires	1,962	$16	6,469	11,640
Other manufactures	25,408	2,702	6,454	4,670
Totals, manufactured	$1,084,462	$2,718	$247,942	$16,533
Totals, rubber exports	$1,110,900	$2,718	$254,500	$16,588

UNITED KINGDOM RUBBER STATISTICS

IMPORTS

	August.			
	1920		1921	
UNMANUFACTURED—	Pounds	Value	Pounds	Value
Crude rubber				
From—				
Straits Settlements	5,962,200	£587,976	3,087,600	£128,136
Federated Malay States	5,926,000	588,726	4,155,600	168,091
British India	725,400	70,884	476,100	19,642
Ceylon and dependencies	5,691,800	546,559	3,021,700	126,669
Other Dutch possessions in Indian Seas	671,900	67,352	1,059,400	45,814
Dutch East Indies (except other Dutch possessions in Indian Seas)	3,089,900	309,586	1,344,500	52,182
Other countries in East Indies and Pacific, not elsewhere specified	209,100	20,890	136,400	5,745
Brazil	1,567,700	131,413	204,900	6,926
Peru	.....	.....	145,700	7,280
South and Central America (except Brazil and Peru)	.....	.....	200	8
West Africa				
French West Africa	9,000	862	600	22
Gold Coast	5,300	586	.....	.....
Other parts of West Africa	56,800	4,549	5,900	198
East Africa, including Madagascar	110,000	9,460	26,900	478
Other countries	313,600	27,630	82,900	1,815
Total	24,338,700	£2,366,473	13,748,400	£563,006
Waste and reclaimed rubber	605,000	6,646	8,000	121
Gutta percha and balata	714,700	169,419	104,600	15,237
Rubber substitutes	232,900	13,787	5,400	126
Totals, unmanufactured	25,891,300	£2,556,325	13,866,400	£578,490
MANUFACTURED—				
Boots and shoes, *doz. pairs*	15,824	£49,519	1,412	£3,825
Waterproof clothing	.....	1,202	.....	315
Insulated wire	.....	8,814	.....	5,007
Tires and tubes	.....	570,293	.....	396,650
Other rubber manufactures	.....	93,171	.....	54,191
Totals, manufactured	.....	£722,999	.....	£459,988

EXPORTS

UNMANUFACTURED—				
Waste and reclaimed rubber	901,900	£25,829	236,100	£5,332
Rubber substitutes	76,500	3,870	29,600	792
Totals, unmanufactured	978,400	£29,699	265,700	£6,124
MANUFACTURED—				
Boots and shoes *doz. pairs*	7,830	£16,047	7,478	£13,211
Waterproof clothing	.....	236,554	.....	107,207
Insulated wire	.....	148,077	.....	88,430
Submarine cables	.....	70,393	.....	72,491
Tires and tubes	.....	601,537	.....	126,855
Other rubber manufactures	.....	394,113	.....	153,819
Totals, manufactured	.....	£1,466,721	.....	£562,013

EXPORTS—COLONIAL AND FOREIGN

UNMANUFACTURED—				
Crude Rubber				
To Russia	7,200	£775	335,700	£10,745
Sweden, Norway and Denmark	29,300	3,005	142,300	6,090
Germany	850,300	80,765	2,464,900	70,196
Belgium	226,400	23,742	204,000	7,356
France	2,389,100	237,926	2,619,800	97,552
Spain	36,000	4,568	30,400	1,202
Italy	697,000	65,157	262,600	8,997
Austria-Hungary	2,200	195	25,700	563
Other European countries	145,000	13,047	1,151,400	31,536
United States	2,804,000	328,298	6,087,600	399,402
Canada	347,900	39,374	2,000	70
Other countries	268,700	26,835	4,900	288
Totals	7,803,100	£823,687	13,331,300	£633,997
Waste and reclaimed rubber	31,400	953	9,500	250
Gutta percha and balata	135,900	23,495	75,300	9,271
Rubber substitutes	21,400	830	1,100	66
Totals, unmanufactured	7,891,800	£848,965	13,417,200	£643,584
MANUFACTURED—				
Boots and shoes, *doz. pairs*	576	£1,424	395	£1,581
Waterproof clothing	.....	316	.....	.....
Insulated wire	.....	41	.....	.....
Tires and tubes	.....	98,822	.....	24,973
Other rubber manufactures	.....	4,432	.....	1,718
Totals, manufactured	.....	£105,035	.....	£28,272

RUBBER STATISTICS FOR ITALY

IMPORTS OF CRUDE AND MANUFACTURED RUBBER

	Four Months Ended April 1920 Quintals[1]	1920 Lire[2]	1921 Quintals	1921 Lire
UNMANUFACTURED—				
Crude rubber and gutta percha—raw and reclaimed:				
From Great Britain	146		144	
Netherlands	.....		2,581	
French Asiastic Colonies	1,837		177	
India and Ceylon	2,672		428	
Dutch East Indies	.....		854	
Straits Settlements	2,562	10,626,700	13,092	17,214,950
French African Colonies	565		.....	
Belgian Congo	466		.....	
Brazil	2,803		530	
Other countries	135		315	
Totals	11,186	10,626,700	18,121	17,214,950
Rubber scrap	111	16,650	103	15,450
Totals, unmanufactured	11,297	10,643,350	18,224	17,230,400
MANUFACTURED—				
India rubber and gutta percha—				
Threads	98	284,200	146	423,400
Sheets, including hard rubber	43	80,400	112	206,900
Tubes	41	87,700	292	410,900
Belting	251	414,150	72	118,800
Rubber-coated fabrics in pieces	181	359,400	232	499,200
Boots and shoes.....*pairs*	37,164	743,280	2,887	57,740
Elastic webbing	104	353,600	349	1,186,600
Clothing and articles for travel	75	300,000	27	108,000
Tires and tubes:				
From Belgium	.....		51	
France	1,140		101	
Great Britain	1,841	11,166,400	143	6,963,600
United States	.....		49	
Other countries	1,007		.....	
Other rubber goods	4,971	9,296,000	2,030	3,847,200
Totals, manufactured	.....	23,085,130	.....	13,822,340
Totals, imports	.....	33,728,480	.....	31,052,740

EXPORTS OF CRUDE AND MANUFACTURED RUBBER

UNMANUFACTURED—				
India rubber and gutta percha—raw and reclaimed:				
To Austria	300		100	
France	131		2,463	
Spain	468	1,142,000	333	1,473,500
United States	1,339		.....	
Other countries	46		51	
Waste	2,884	576,800	913	182,600
Totals, unmanufactured	5,168	1,718,800	3,860	1,656,100
MANUFACTURED—				
India rubber and gutta percha—				
Threads	147	455,700	114	353,400
Sheets, including hard rubber	110	202,000	139	296,100
Tubes	556	722,050	807	1,047,200
Belting	.....	.....	7	14,700
Rubber-coated fabrics in pieces	89	260,600	93	277,400
Boots and shoes.....*pairs*	445	8,900	100	2,000
Other	1	1,500	2	3,000
Elastic webbing	478	1,816,400	298	1,132,400
Clothing and articles for travel	156	780,000	25	125,000
Tires and tubes:				
To Austria	377		683	
Belgium	277		836	
Czecho-Slovakia	428		90	
Denmark	487		1	
France	643		346	
Great Britain	3,622		3,461	
Netherlands	222		156	
Roumania	563		641	
Spain	134	34,415,000	107	24,025,000
Switzerland	138		207	
Hungary	216		.....	
India and Ceylon	1,945		406	
Dutch East Indies	791		721	
Straits Settlements	716		12	
Australia	231		.....	
Argentina	1,222		610	
Brazil	954		124	
Other countries	800		1,209	
Other rubber goods	3,569	6,636,000	4,982	9,165,800
Totals, manufactured	.....	45,298,150	.....	36,442,000
Total exports	.....	47,016,950	.....	38,098,100

[1]One quintal equals 220.46 pounds.
[2]One lira equals $0.193 (normal).

THE MARKET FOR RUBBER SCRAP

NEW YORK

THE market continues to remain unchanged. Scrap offerings by dealers are of light proportions. High freight rates are causing the withholding of stocks in storage on scrap of all grades. In boots and shoes large tonnage is not available owing to relatively small domestic collection.

Some foreign shoes have been offered at prices above domestic. In tires and inner tubes there is practically no business available owing to inactivity in the reclaiming trade.

QUOTATIONS FOR CARLOAD LOTS DELIVERED

October 25, 1921

Prices subject to change without notice

BOOTS AND SHOES			
Boots and shoes	*lb.*	$0.03¼ @	.03¼
Trimmed arctics	*lb.*	.02½ @	
Untrimmed arctics	*lb.*	*.02 @	
HARD RUBBER			
Battery jars, black compound	*lb.*	*.07½ @	
No. 1, bright fracture	*lb.*	*.12 @	.15
INNER TUBES			
No. 1	*lb.*	.04¼ @	
Compounded	*lb.*	.03¾ @	
Red	*lb.*	.03½ @	
MECHANICALS			
Black scrap, mixed, No. 1	*lb.*	*.02¼ @	.03
No. 2	*lb.*	*.01½ @	.02
Heels	*lb.*	*.02½ @	.03
Horse-shoe pads	*lb.*	*.02½ @	.03
Hose, air brake	*lb.*	*.01 @	.01½
fire, cotton lined	*lb.*	*.01 @	
garden	*lb.*	.07 @	
Matting	*lb.*	*.01 @	
Red packing	*lb.*	*.04½ @	.05
Red scrap, No. 1	*lb.*	*.07 @	.08
No. 2	*lb.*	*.05½ @	.06
White scrap, No. 1	*lb.*	*.07 @	.07½
No. 2	*lb.*	*.06 @	.06½
TIRES			
PNEUMATIC—			
Auto peelings	*lb.*	.01½ @	
Bicycle	*lb.*	.01 @	.01¼
Standard white auto	*lb.*	*.02¼ @	.02¾
Mixed auto	*lb.*	.00¾ @	.01
Stripped, unguaranteed	*lb*	*.01 @	.01½
White, G. & G., M. & W., and U. S.	*lb.*	*.02¾ @	
SOLID—			
Carriage	*lb.*	*.02¼ @	.02¾
Iron	*lb.*	@	
Truck, clean	*lb.*	*.01½ @	.02

*Nominal.

THE MARKET FOR COTTON AND OTHER FABRICS

NEW YORK

AMERICAN COTTON. Spot middling upland cotton prices experienced two or three sharp upward changes during the past month, the lowest quotation being 18½ cents and the highest 21½ cents. At this date, October 25, the declines more than offset the increases in price and spot cotton is around 19 cents, nearly 1¼ cents less than a month ago.

Cotton fabrics responded to the sharp advance in raw cotton in September and are retaining that advance, irrespective of market changes downward.

EGYPTIAN COTTON. The market on Egyptian grades is much easier, the Alexandria market having dropped sharply during the past ten days. Medium-grade uppers are now selling at around 30 cents and medium-grade Sakellarides four cents higher. This cotton is, therefore, on an attractive basis. While Sakellarides is in large supply and may sell more cheaply, the prices cannot decline much further, except on some extremely unfavorable news, because of the limited quantities of uppers available.

SEA ISLAND COTTON. This grade is also steady. A recent sale has been reported of extra choice at 45 cents.

ARIZONA COTTON. The recent rains in Arizona have lowered grades considerably and practically all cotton coming in now is

choice and low. The price of Pima cotton is very steady, and medium grades range between 40 and 43 cents.

MECHANICAL DUCKS AND DRILLS. Mechanical and other rubber lines are steadily increasing their consumption of these fabrics because of the improvement in industrial demand. Mechanical duck prices rule from 36 to 40 cents, with the market strong and reasonably active.

RAINCOAT CLOTHS. The demand for raincoat fabrics has shown a decided improvement.

SHEETINGS. The rubber trade shows little interest in the purchase of sheetings even at concessions in price. This has been attributed to the reduction in the market prices of cotton, but more probably is due to subnormal conditions ruling in all branches of the rubber industry.

TIRE FABRICS. Some purchases of tire fabrics are being made and the outlook favors a good demand by January 1. The market has fluctuated about 10 cents a pound.

NEW YORK QUOTATIONS

October 25, 1921

Prices subject to change without notice

BURLAPS			
32—7-ounces	100 yards	$4.00	@
32—8-ounces		4.00	@
40—7½-ounce		4.25	@
40—8-ounce		4.30	@
40—10-ounce		5.50	@
40—10½-ounce		5.65	@
45—7½-ounce		5.50	@
45—8-ounce		5.60	@
45—10-ounce		7.00	@
DRILLS			
38-inch 2.00-yard	yard	.20	@
40-inch 3.47-yard		.13	@
52-inch 1.90-yard		.26¾	@
52-inch 1.95-yard		.25⅝	@
60-inch 1.52-yard		.33	@
DUCK			
CARRIAGE CLOTH			
38-inch 2.00-yard enameling duck	yard	.20	@
40-inch 1.74 yard		.22½	@
72-inch 16.66-ounce		.46⅞	@
72-inch 17.21-ounce		.48⅜	@
MECHANICAL			
Hose	pound	.37	@
Belting		.37	@
HOLLANDS, 40-INCH			
Acme	yard	.20	@
Endurance		.25½	@
Penn		.27½	@
DEAD FINISH			
Piece		.20	@
Cut		.25	@
FLAT FINISH			
Piece		.16½	@
Cut		.18½	@
LONSDALE			
White, piece		.40	@
cut		.50	@
Colors, piece		.42½	@
cut		.53	@
Green and blue, piece		.46½	@
cut		.58	@
NAINSOOKS			
White		.18	@ .21¼
Flesh		.22	@
RAINCOAT FABRICS			
COTTON			
Bombazine 64 x 60	yard	.13	@
60 x 48		.11½	@
Cashmeres, cotton and wool, 36-inch, tan		.55	@
Twills 64 x 72		.10	@ .12
60 x 102		.14	@
Twill, mercerized, 36-inch, blue and black		.26½	@
tan and olive		.25	@
Tweed		.20	@ 1.00
printed		.15	@
Plaids 60 x 48		.12½	@
56 x 44		.11¾	@
Repp			@
Prints 60 x 48		.13	@
64 x 60		.14	@
IMPORTED WOOLEN FABRICS SPECIALLY PREPARED FOR RUBBERIZING—PLAIN AND FANCIES			
63-inch, 3¼ to 7½ ounces	yard		@
36-inch, 2¾ to 5 ounces			@
IMPORTED PLAID LINING (UNION AND COTTON)			
63-inch, 3½ to 7 ounces	yard		@
36-inch, 2 to 4 ounces			@
SHEETINGS, 40-INCH			
48 x 48, 2.50-yard	yard	$0.14¼	@
48 x 48, 2.85-yard		.12¾	@
64 x 68, 3.15-yard		.14¼	@
56 x 60, 3.60-yard		.12¾	@
48 x 44, 3.75-yard		.11½	@
SILKS			
Canton, 38-inch	yard	.29½	@
Schappe, 36-inch		.45	@
STOCKINETTES			
SINGLE THREAD			
3½ Peeler, carded	pound		@
4½ Peeler, carded			@
6½ Peeler, combed			@
DOUBLE THREAD			
Zero Peeler, carded	pound		@
3½ Peeler, carded			@
6½ Peeler, combed			@
TIRE FABRICS			
BUILDING			
17¼-ounce Sakellarides, combed	pound	1.03	@ 1.25
17¼-ounce Egyptian, combed		.80	@ .90
17¼-ounce Egyptian, carded		.75	@ .90
17¼-ounce Peelers, combed		.85	@ .90
17¼-ounce Peelers, carded		.65	@

CORD			
15-ounce Egyptian	pound	$0.85	@ $1.00
BICYCLE			
8-ounce American	pound	.75	@
10-ounce American		.70	@
CHAFER			
9½-ounce Sea Island	pound	1.15	@
9¼-ounce Egyptian, carded		.85	@ .98
9¼-ounce Peeler, carded		.73	@ .75

THE MARKET FOR CHEMICALS AND COMPOUNDING INGREDIENTS

NEW YORK

THE past month the outlook in the market for rubber compounding ingredients has steadily improved. Stocks in dealers' hands are not excessively large and demand is gradually increasing. Increased firmness in the price of spelter has eliminated any rumors as to further reduction in the price of zinc oxide and lithopone. Competition from foreign sources is not accounted an important factor at present.

ANILINE. Improved demand at 18 cents was noted about the middle of the month when quotations dropped from 20 cents a pound.

ANTIMONY SULPHIDES. Prices have suffered some reduction. Demand is light and quotations nominal.

BARYTES. Business has continued routine at $23 a ton. The large stock of foreign barytes has not been a disturbing factor.

BENZOL. Average production has been around 25 per cent for a considerable period. Increased activity in the steel industry, calling for coke production is improving the supply of benzol for which there exists a large demand. The fine grade is quoted from 27 to 33 cents and 90 per cent from 25 to 31 cents a gallon.

BLANC FIXE. Very little improvement in business has been noted and price has held steadily at 3½ to 3¾ cents a pound.

CADMIUM SULPHIDE has been in short supply; quoted at $1.25 to $1.50 a pound.

CARBON BISULPHIDE. An active demand from the rubber trade, manifest early in the month, was of brief duration.

CARBON TETRACHLORIDE. Quotations have ruled from 10½ to 12 cents a pound and demand very moderate.

CHINA CLAY. There has been active call for both domestic and foreign goods. Freight rates are against the free movement of domestic China clay.

DRY COLORS. The trade outlook is said to be improving gradually. There have been some price reductions. English vermilion early in October was quoted at a decline of five cents a pound owing to reduction in the price of mercury.

GAS BLACK. Both gas black and lamp black are in very steady demand.

LITHARGE. During most of the month the business showed gradual increase particularly from the rubber trade.

LITHOPONE. Arrivals of German lithopone have not proved of satisfactory quality in comparison with the American product. Prices for the latter are guaranteed for the quarter.

SOLVENT NAPHTHA. The supply has been restricted and demand active. Quotations have ruled from 25 to 30 cents a gallon.

SUBLIMED LEAD. A constantly slow improvement in inquiry has taken place. Prices 6¾ to 7 cents a pound.

SULPHUR. Steady routine business has marked this material for the entire month.

TALC. There are ample spot stocks and steady call for both foreign and domestic product.

WHITING. This material is in ordinary demand at fair prices.

ZINC OXIDE. There has been liberal consumption by the tire manufacturing industry with business increasing from that quarter. Prices rule low and firm.

NEW YORK QUOTATIONS

October 25, 1921

Prices subject to change without notice

ACCELERATORS, ORGANIC			
Accelerene (f. o. b. English port)	lb.	13s.	@
Accelemal (bbls.)	lb.	$0.50	@
Adco	lb.	.75	@
Aldehyde ammonia crystals	lb.	.95	@ 1.00
Aniline oil (f. o. b. factory)	lb.	.18	@ .24
Excellerex	lb.	.60	@ .65
Formaldehyde aniline	lb.	.50	@ .55
Hexamethylene tetramine	lb.	.77½	@ .80½
Lead oleate (400 lb. bbls. factory)	lb.	.12	@
N. C. C.	lb.		@
No. 999	lb.	.14	@
Paradin	lb.	.40	@
Paraphenylene diamine	lb.	1.70	@ 1.75
Thiocarbanilide	lb.	.37	@ .52
Vulcocene	lb.		@
X L O	lb.	2.00	@
ACCELERATORS, INORGANIC			
Lead, dry red	lb.	.10	@
sublimed blue	lb.	.07	@
sublimed white	lb.	.07	@
white, basic carbonate	lb.	.06½	@ .07½
Lime, flour	lb.	.02	@ .02½
Litharge, domestic	lb.	.08	@ .08½
imported	lb.	.17	@
sublimed	lb.		@
Magnesium, carbonate, light	lb.	.07	@ .10
calcined light (bbls.)	lb.	.27	@ .30
extra light (bbls.)	lb.	.50	@
medium light (bbls.)	lb.	.25	@
calcined heavy (bbls.)	lb.	.06	@ .07
ACIDS			
Acetic 28 per cent	lb.	.02½	@ .03
glacial, 99 per cent	lb.	.10	@ .10¼
Cresylic (97% straw color, drums)	gal.	.70	@ .75
(95% dark, drums)	gal.	.65	@ .70
Muriatic, 20 degrees	lb.	.01½	@ .02
Nitric, 36 degrees	lb.	.05¼	@ .06¼
Sulphuric, 66 degrees	ton	17.00	@ 18.00
ALKALIES			
Caustic soda	lb.	.04	@ .05
Soda ash, 58%	cwt.	2.10	@ 2.15
COLORS			
Black			
Bone, powdered	lb.	.06½	@ .08½
Carbon black (sacks, factory)	lb.	.10½	@ .20
pressed	lb.		@
Dipped goods	lb.	1.00	@
Drop	lb.	.07½	@ .16
Ivory black	lb.	.15	@ .45
Lampblack	lb.	.17	@ .45
Micronex	lb.	.09	@ .11
Oil soluble aniline	lb	.95	@
Rubber black	lb.	.10	@ .16
Rubber makers' non-flying black	lb.	.40	@
Blue			
Cobalt	lb.	.27	@ .35
Dipped goods	lb.	1.00	@
Prussian	lb.	.50	@
Rubber makers' blue	lb.	3.50	@
Ultramarine	lb.	.16	@ .35
Brown			
Iron oxide	lb.	.04½	@ .05½
Sienna, Italian, raw and burnt	lb.	.06	@ .07½
Sienna, Italian, raw (tan color)	lb.	.07	@
Umber, Turkey, raw and burnt	lb.	.05½	@ .06½
Vandyke	lb.	.04	@ .05
Green			
Chrome, light	lb.	.30	@ .32
medium	lb.	.35	@ .36
dark	lb.	.36	@ .45
commercial	lb.	.12	@
tile	lb.	.15	@
Guignet	lb.	1.50	@
Dipped goods	lb.	1.00	@
Oxide of chromium	lb.	.50	@ .60
Rubber makers' green	lb.	3.50	@

COLORS—Continued

Red

Antimony, crimson	lb.	.40	@	.44
crimson, 15/17% (bbls)	lb.	.49	@	
crimson, F	lb.	.35	@	
crimson, R. M. P.	lb.	.48	@	
Antimony, golden	lb.	.21	@	.27
golden, R. M. F.	lb.	.18	@	
golden 1	lb.	.30	@	
golden 2	lb.	.25	@	
golden, 15/17% (bbls.)	lb.	.25	@	
7-A	lb.	.35	@	
vermilion	lb.	.55	@	
red sulphuret	lb.	.23	@	
Arsenic, red sulphide	lb.	.11½	@	
Dipped goods, red	lb.	1.00	@	
purple	lb.	1.00	@	
orange	lb.	1.00	@	
Indian	lb.	.08	@	.14
Iron oxide, reduced grades	lb.	.03	@	.13
pure bright	lb.	.05	@	.14
Maroon oxide	lb.	.12	@	.12½
Oil soluble aniline, red	lb.	1.75	@	2.00
orange	lb.	1.50	@	
Oximony	lb.	.16	@	
Para toner	lb.	1.40	@	
Red excelsior	lb.		@	
Rubber-makers' red (four shades)	lb.	3.50	@	
purple	lb.	2.50	@	
Spanish natural	lb.	.04½	@	.05
Toluidine toner	lb.	2.50	@	2.75
Venetian	lb.	.02½	@	.05
Vermilion, American	lb.	.25	@	.30
permanent	lb.		@	
English quicksilver	lb.	.80	@	.85

White

Albalith	lb.	.06	@	.06½
Aluminum bronze	lb.	.60	@	.65
Lithopone, Beckton white	lb.	.06	@	.06½
Lithopone, domestic (factory)	lb.	.06	@	.06½
Ponolith (carloads, factory)	lb.		@	
Rubber-makers' white	lb.		@	
		C.L.	@	L.C.L.
Zinc oxide. American Horse Head (factory):				
Special	lb.	.08	@	.08½
XX red	lb.	.07½	@	.08½
French process, Florence brand (factory):				
White seal	lb.	.11	@	.11¼
Green seal	lb.	.09¼	@	.10½
Red seal	lb.	.08¼	@	.09½
White seal	lb.	.11	@	.13
Azo (factory):				
ZZZ (lead free)	lb.	.07½	@	.08
ZZ (under 5% leaded)	lb.	.07¼	@	.07¼
Z (8-10% leaded)	lb.	.97	@	.07½

Yellow

Arsenic, yellow sulphide	lb.		@	
Cadmium, sulphide	lb.	1.25	@	1.50
Chrome, light and medium	lb.	.18	@	
C. P.	lb.	.23	@	
Dipped goods	lb.	1.00	@	
Ochre, domestic	lb.	.02	@	.03
imported	lb.	.03	@	.03½
Oil soluble aniline	lb.	1.60	@	
Rubber makers' yellow	lb.	3.50	@	
Zinc yellow	lb.	.33½	@	

COMPOUNDING INGREDIENTS

Aluminum flake (carloads)	ton	25.00	@	29.45
hydrate, light	lb.	.22	@	.25
Ammonium carbonate (lump)	lb.	.13	@	.13½
Asbestine	ton	20.00	@	25.00
Barium, carbonate, precipitated	ton	85.00	@	
dust	ton	100.00	@	
Barytes, pure white (carloads)	ton	23.90	@	
off color (carloads)	ton	20.00	@	
uniform floated (carloads)	ton	23.90	@	
Basofor	lb.	.04	@	
Beta-naphthol	lb.	.33	@	
Blanc fixe	lb.	.03½	@	.04
Bone ash	lb.		@	
Carrara filler (factory)	ton	18.00	@	
Chalk, precipitated, extra light (f. o. b. factory)	lb.	.03½	@	.04½
heavy (f. o. b. factory)	lb.	.02½	@	.03¼
China, clay, Dixie	ton	22.00	@	32.00
Blue Ridge	ton	22.00	@	32.00
domestic	ton	25.00	@	
imported, lump	ton	16.00	@	24.00
Cotton linters, clean mill run	lb.	.04	@	
Fossil flour (powdered)	ton	60.00	@	
(bolted)	ton	65.00	@	
Glue, high grade	lb.	.30	@	.40
medium	lb.	.22	@	.28
low grade	lb.	.15	@	.18
Graphite, flake	lb.	.10	@	
amorphous	lb.	.05	@	
Ground glass FF. (bbls.)	lb.		@	
Infusorial earth (powdered)	ton	60.00	@	
(bolted)	ton	65.00	@	
Liquid rubber	lb.	.15	@	
Mica, powdered	lb.	.15	@	
Phenanthrene	lb.		@	
Pumice stone, powdered	lb.	.03	@	.08
Rotten stone, powdered (bbls.)	lb.	.02½	@	.04½
Rubber paste	lb.		@	
Silica, aluminum	ton	23.00	@	25.00
gold bond	ton		@	
silver bond	ton		@	
Soap bark, cut	lb.	.10½	@	.12
Soapstone, powdered-gray (carloads)	ton	12.00	@	
Starch, powdered corn	cwt.	1.88	@	2.10
Talc, powdered soapstone	ton	25.00	@	
Terra blanche	ton	22.50	@	26.00
Tripoli flour, air-floated, cream or rose (factory)	ton		@	
white (factory)	ton		@	
Tyre-lith	ton	85.00	@	
Whiting, Alba	cwt.	15.00	@	18.00
Columbia	cwt.		@	
commercial	cwt.	1.05	@	1.10
Danish	ton		@	
English cliffstone	cwt.	1.60	@	2.00
gilders	cwt.	1.20	@	1.35
Paris, white, American	cwt.	1.30	@	1.40
Quaker	ton	13.00	@	15.00
Superfine	ton		@	
Wood pulp, imported	ton		@	
XXX (f. o. b. factory)	ton	35.00	@	
X (f. o. b. factory)	ton	27.50	@	
Wood flour	ton		@	

MINERAL RUBBER

Elateron (c. l. factory)	ton		@	
(l. c. l. factory)	ton		@	
Gilsonite	ton	70.00	@	
Genasco (c. l. factory)	ton	50.00	@	
(l. c. l. factory)	ton	52.00	@	
Hard hydrocarbon	ton	34.00	@	45.00
Soft hydrocarbon	ton	33.00	@	40.00
320/340 M. P. hydrocarbon (c. l. factory)	ton	47.50	@	
(l. c. l. factory)	ton	50.00	@	
300/310 M. P. hydrocarbon (c. l. factory)	ton	42.50	@	
(l. c. l. factory)	ton	45.00	@	
Pioneer, M. R. (c. l. factory)	ton	36.00	@	65.00
Raven M. R.	ton		@	
Robertson, M. R. pulverized (c. l. factory)	ton		@	
M. R. pulverized (l. c. l. factory)	ton		@	
M. R. (c. l. factory)	ton	52.50	@	
M. R. (l. c. l. factory)	ton	55.00	@	
Rubrax (c. l. factory)	ton	50.00	@	
States "A" (l. c. l.)	ton	45.00	@	
No. 1 (l. c. l.)	ton	40.00	@	
Sympro, granulated, M. R. (factory)	ton	59.50	@	64.50

OILS

Avoitas compound (bbls.)	lb.	.14	@	
Castor, No. 1, U. S. P.	lb.	.12	@	
No. 3, U. S. P.	lb.	.11	@	
Corn (bbls. factory)	lb.	.10	@	
refined	lb.	.11½	@	.1
Cotton (bbls. factory)	lb.	.10	@	
Glycerine (98 per cent)	lb.	.14½	@	.15
Halowax	gal.	.25	@	.27
Linseed, raw, domestic	gal.	.70	@	
imported	gal.		@	
Linseed compound	gal.		@	
Palmoline	lb.		@	
Palm, niger (casks, factory)	lb.	.07	@	
Peanut (bbls. factory)	lb.	.11	@	
Petrolatum, standard	lb.	.08	@	
Petrolatum, sticky	lb.	.10	@	
Pine, steam distilled	gal.	.97	@	1.30
Rapeseed, refined (factory)	lb.	.12	@	
blown	lb.	.13½	@	
Rosin	gal.	.40	@	.44
Synpro	gal.	.35	@	.60
Soya bean	lb.	.09	@	
Tar	gal.	.29	@	.33

RESINS AND PITCHES

Cantella gum	lb.		@	
Cumar resin, hard	lb.	.09	@	.12
soft	lb.	.09	@	.12
Tar, retort	bbl.	9.50	@	12.00
kiln	bbl.	9.50	@	11.50
pine retort	bbl.		@	
Pitch, Burgundy	lb.	.05	@	
coal tar	lb.	.01¼	@	
pine tar	lb.	.03½	@	
ponto	lb.	.08	@	
Rosin, K (bbl.)	280 lbs.	6.45	@	
strained (bbls.)	280 lbs.	6.10	@	
Shellac, fine orange	lb.	.75	@	.80

SOLVENTS

Acetone (98.99 per cent drums [6.62 lbs. per gal.])	lb.	.12½	@	.13½
Benzol (90%, drums [7.21 lbs. per gal.])	gal.	.25	@	.31
pure (drums)	gal.	.27	@	.37
Carbon bisulphide (drums [10.81 lbs. per gal.])	lb.	.07	@	.07¼
tetrachloride (drums [13.28 lbs. per gal.])	lb.	.11	@	.13
Paracymene (factory)	gal.	1.00	@	
Motor gasoline (steel bbls.)	gal.	.25	@	
73@76 degrees (steel bbls.)	gal.		@	
68@70 degrees (steel bbls.)	gal.		@	
Naphtha, V. M. & P. (steel bbls.)	gal.	.23½	@	
solvent (drums extra)	gal.	.23	@	
Toluol, pure (7.21 lbs. per gal.)	gal.	.28	@	.34
Turpentine, spirits	gal.	.76	@	
wood	gal.	.74	@	
Xylol, pure (7.21 lbs. per gal.)	gal.	.40	@	.43
commercial	gal.	.28	@	.35

SUBSTITUTES

Black	lb.	.08 @	.14
Brown	lb.	.11 @	.15
White	lb.	.09 @	.16
Brown factice	lb.	.07 @	.14½
Rubber factice	lb.	@	
White factice	lb.	.08½ @	.15½
Paragol, soft and medium	cwt.	@	
hard	cwt.	@	

VULCANIZING INGREDIENTS

Lead, black hyposulphite (black hypo)	lb.	.40 @	
Orange mineral, domestic	lb.	.11 @	.13
Sulphur chloride (jugs)	lb.	.20 @	
(drums)	lb.	.08 @	
Sulphur, flour, Brooklyn brand (carloads)	cwt.	@	
Brooklyn brand (less carload)	cwt.	@	
Bergenport brand (bbls.)	cwt.	2.55 @	
(bags)	cwt.	2.30 @	
Light 100% pure (bbls)	cwt.	2.60 @	3.15
(bags)	cwt.	2.35 @	2.90
Superfine 99½% pure (carloads, bbls.)	cwt.	2.40 @	2.90
(bags)	cwt.	2.00 @	2.50

(See also Colors—Antimony).

WAXES

Wax, beeswax, white, commercial	lb.	.55 @	
ceresine, white	lb.	.12 @	
carnauba	lb.	.16 @	
Montan	lb.	.07 @	
ozokerite, black	lb.	.25 @	
green	lb.	.25 @	
paraffine	lb.	.02 @	.06½
sweet wax	lb.	.12 @	

WOBURN OIL SOFTENER

Woburn oil, a residual product from degreasing hides, is light-brown in color and consists of two-thirds saponifiable and one-third non-saponifiable matter. It does not volatilize under 350 degrees F.

Its value as a softener for dry rubber stocks has been demonstrated in hard rubber mechanical goods and tire treads, and found equivalent to cotton oil and petroleum mixed in the same proportions. Nine months' aging tests indicate that the oil does not injure rubber goods containing it.

OCEAN RATES FROM NEW YORK ON TIRES, TUBES, MECHANICAL GOODS, CLOTHING, FOOTWEAR AND DRUGGISTS' SUNDRIES[1]

(Same rates apply from other Atlantic ports where service is available.)

Country and Port	Rates Cu. Ft.	Rates 100 lbs.
AFRICA		
AFRICA, EAST COAST—		
Beira	..	*$26.00
Plus landing charges $0.30 per ton.		
Kilendini	..	*30.40
Delagoa Bay	..	*25.40
Lourenco Marques	..	*31.00
Mauritius	..	*22.00
NORTH COAST—		
All ports	..	*22.00
EGYPT—		
Alexandria	..	*22.00
SOUTH COAST—		
Algoa Bay	..	*23.60
Capetown	..	*23.00
East London	..	*24.20
Port Natal	..	*24.80
WEST COAST—		
Accra-Lagos, Secondi, Buruttu	..	*30.00
Dakar, Freetown	..	*28.00
Boma, Matadi	..	*32.00
ASIA		
CHINA—		
Hongkong, Shanghai	..	*23.00
INDIA—		
All direct ports	..	*21.00
Madras, Rangoon	..	*23.00
JAPAN—		
All direct ports	..	*23.00
JAVA—		
All ports	..	*21.00
MANCHURIA—		
Dalny	..	*24.00
PHILIPPINES—		
Manila	..	*23.00
STRAITS SETTLEMENTS—		
Singapore, Penang	..	*21.00
SYRIA—		
Beyrout	..	*24.00
CENTRAL AMERICA		
COSTA RICA—		
Port Limón	$.64	1.31
MEXICO—		
Tampico	.52½	1.05
Plus 2½c. per 100 lbs. bar dues.		
Vera Cruz, Puerto Mexico	.52½	1.05

[1]Compiled by Austin Baldwin & Co., Inc., foreign freight contractors, 44 Whitehall street, New York, N. Y.

Country and Port	Rates Cu. Ft.	Rates 100 lbs.
PANAMA—		
Colon	.32	.64
Plus $1 per ton transfer charge.		
Panama	.37	.74
Plus $1 per ton transfer charge.		
SALVADOR—		
La Libertad	.79	1.42
EUROPE		
BELGIUM—		
Antwerp	.40	.75
BRITISH ISLES—		
All ports	.45	.85
Except rubber belting	.50	1.00
CANARY ISLANDS—		
Las Palmas	..	*25.00
DENMARK—		
Copenhagen	.55	1.00
ESTHONIA—		
Reval	.75	1.50
FINLAND—		
Helsingfors	.75	1.50
FRANCE—		
All Atlantic ports	.40	.75
Marseilles	..	*20.00
GERMANY—		
Hamburg, Bremen	.45	.82½
Danzig	.50	.90
GREECE—		
All ports	..	*22.00
HOLLAND—		
Rotterdam	.40	.75
Amsterdam	.40	.75
ITALY—		
Direct ports	.50	1.00
Fiume, Trieste, Venice	..	*26.00
NORWAY—		
All ports	.55	1.00
PORTUGAL—		
Lisbon	..	*20.00
Oporto	..	*25.00
RUMANIA—		
All ports	..	*25.00
SPAIN—		
All ports	..	*20.00
Gibraltar	.65	1.20
SWEDEN—		
Malmö, Stockholm	.60	1.25
Gothenburg	.50	1.00
SOUTH AMERICA		
ARGENTINA—		
Buenos Aires	..	*20.00
Rosario	..	*27.50

Country and Port	Rates Cu. Ft.	Rates 100 lbs.
BRAZIL—		
Rio de Janeiro	..	*22.50
Santos	..	*20.00
Bahia	..	*24.00
Pernambuco	..	*23.50
CHILE—		
All ports	.74	1.32
COLOMBIA—		
Cartagena, Puerto Colombia, Santa Marta	.51	1.12
Plus government charges.		
Buenaventura—		
(via direct steamer)	1.03	1.84
(via transshipment)	.98	1.75
ECUADOR—		
Guayaquil—		
(via direct steamer)	.74	1.32
(via transshipment)	.70	1.25
PERU—		
Callao, Mollendo	.74	1.32
URUGUAY—		
Montevideo	..	*20.00
VENEZUELA—		
La Guayra	.40	.65
Plus 4c per 100 kilos landing charge.		
OCEANIA		
AUSTRALIA—		
All ports	..	*25.00
NEW ZEALAND—		
All ports	..	*25.00
WEST INDIES		
BERMUDA—		
Hamilton	.37	.75
Grenada, St. Croix, St. Thomas, St. Kitts	.50	1.00
Port of Spain	.40	.75
CUBA—		
Havana	.47	.94
Plus 30c per 100 lbs. Cuban wharfage and handling charges.		
Santiago	.59	1.18
Cienfuegos	.61	1.21
CURAÇAO—		
Curaçao	.30	.65
JAMAICA—		
Kingston	.42	.84
PORTO RICO—		
All ports	.31	.75
Less 10% plus 1c per cu. ft. or 2½c per 100 lbs. landing charge at destination.		
SANTO DOMINGO—		
Santo Domingo	.51	.91

*Rate figured on ton of 40 cubic feet or 2,240 lbs.

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FOUNDED 1889

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